

# 637

PIONEER VENUS 1

12 SECOND SAMPLED ENERGETIC ION (40 EV)  
78-051A-11D

12 SECOND DATA 1 HOUR AROUND PERIAPSIS  
78-051A-12F,13E

2 MINUTE OVERLAPPED AVG., EVERY MINUTE  
78-051A-12G,13D

LOW & HIGH RESOL. NEUT. DENSITIES  
78-051A-11G

HIGH RESOL-ENERGETIC ION (>40EV)  
78-051A-11F

REQ. AGENT	RAND NO.	ACQ. AGENT
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RLR		DKB

PIONEER VENUS-1

12 SECOND SAMPLED ENERGETIC ION (40 EV) DATA

78-051A-11D

This data set consists of 1 tape. The tape is 1600 bpi, 9-track, multifiled, ascii, and created on the IBM 360. The D and C numbers, time spans, and number of files are as follows:

D#	C#	FILES	TIME SPANS
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D-78715	C-26834	1	12/05/78 - 01/03/89

07-MAR-90

TO: 633/P. Butterworth  
National Space Science Data Center

FROM: 615.1/W.T. Kasprzak

SUBJECT: Pioneer Venus Orbiter Neutral Mass Spectrometer  
Replacement tape for NSSDC data set 78-051A-11D  
(ASCII 12 s Energetic Ion Tape Orbits 1 to 3681)  
Replacement fiche for NSSDC data set 78-051A-11E  
(Energetic Ion Fiche Orbits 1 to 3681)

Enclosed is a replacement tape for the above data sets. The set contains 12 second sampled energetic ion data with orbital position parameters added. Since the data set was submitted in 1987 several improvements have been made in the data: a) corrections to the flux, density and direction for the spacecraft velocity have not been included; b) the flux has been evaluated for an energy of 40 eV rather than 45 eV as in the prior data set; c) the data set has been expanded in coverage to orbit 3681.

Any questions or problems with the data or the data tapes should be communicated to:

W.T. Kasprzak            301-286-8253

07-NOV-1989

NSSDC DOCUMENTATION FOR  
PIONEER VENUS ORBITER NEUTRAL MASS SPECTROMETER

## LOW RESOLUTION ENERGETIC ION DATA

## I. The Orbiter Neutral Mass Spectrometer (ONMS)

The instrument was primarily designed to determine the composition of the neutral exosphere/thermosphere of Venus. However, it has also detected energetic or fast ions whose energy exceeds 40 eV in the spacecraft frame of reference. These ions were observed in early orbits at an altitude higher than that required for measuring the neutral density at periapsis. Once the periapsis altitude had risen above the point where sensible neutral density measurements could be made the instrument was configured specifically to detect energetic ions.

The ONMS instrument has been described in "Pioneer Venus Orbiter Neutral Gas Mass Spectrometer Experiment," IEEE Transactions on Geoscience and Remote Sensing, GE-18 (1), 1980. A summary of the early results for energetic ions has been described in "Observations of Energetic Ions near the Venus Ionopause," Planet. Sp. Sci., 30, 1107-1115, 1982. The method used to reduce the energetic ion data to a flux and density has been described in "Observations of Energetic Ions on the Nightside of Venus," J. Geophys. Res., 92, 291-298, 1987. The data has been used as part of a study of the iontail of Venus in "The Iontail of Venus: Its Configuration and Evidence for Ion Escape," J. Geophys. Res., 92, 15-26, 1987. The global nature of the data has been summarized for the first 2500 orbits in "Fast O<sup>+</sup> Ion Flow Observed Around Venus at Low Altitudes.", NASA TM 100717. The angular response and minimum energy have been evaluated in "Pioneer Venus Neutral Mass Spectrometer," a GSFC summer institute project report by Yvette Guenther. The method used to reduce the data assumes cylindrical symmetry of the ion source but in actual fact the source is asymmetrical in its angular response. This can introduce scatter in the data that is a function of the angle of attack. No simple solution has been found for modeling this asymmetry since the actual ion drift vector is unknown. The minimum energy of an ion detectable by the ONMS in energetic ion mode is 35.9 eV, the maximum transmission is assumed to occur about 10 V above this value. On the nightside of Venus the spacecraft potential is negative and the most probable ion energy is near 40 eV. The papers are reproduced here for convenient reference.

## II. Reduction to flux and number density

Reference to the basic data reduction has been given in Section I. Because of the paucity of data at other mass numbers only mass 16 (atomic oxygen) has been reduced to a flux and number density. As part of the reduction process the angle in the ecliptic plane of the apparent ion flow in space-craft reference frame has been deduced. No correction has been applied to the angle, density or flux in order to remove the space-craft velocity. In order to fit the data a minimum of 30 points were required in 36 seconds. In addition the maximum to minimum count ratio was required to be a factor of 3 or greater in order to insure that there was a definitive spin modulation. For those masses not fit by this process (all masses except 16 [atomic oxygen]) or those data that did not satisfy the above criteria a separate plot of the maximum count rate per 12 seconds was included in the microfiche data set. A rough conversion of  $4 \times 10^7 \text{ cm}^{-2} \text{ s}^{-1} / 10^4 \text{ counts s}^{-1}$  can be used to convert to a flux and a speed of  $2.2 \times 10^6 \text{ cm s}^{-1}$  can be used to convert to number density. A constant spacecraft potential of -5 v has been assumed in assigning the effective energy of the ions to 40 eV. The minimum count rate is 1 per integration period or about 6 to 12 counts/s, depending on the bit rate and format of the telemetry data. The ion species regularly monitored include: He, N, O, N<sub>2</sub>/CO and CO<sub>2</sub>.

In general for orbit numbers 1 to 645 data were taken from RPA mode since the gas background with the filament on was considerably less than in non-RPA mode. For orbit numbers above 923 the instrument was deliberately configured with the filament off and non-RPA mode data was used. For mass 16 the RPA voltage is about +3.8 volts.

## III. Summary data.

All orbits have been processed where data exists or can be visually determined to exist. For orbits 1 to 645 a visual examination of the neutral mode data is required in order to identify the regions of energetic ions. For orbits beyond 923 no visual examination was needed. The ONMS instrument was not on for all orbits nor were energetic ions seen on all those orbits in which it was in operation. On the dayside of Venus energetic ions were seen only near the ionopause and when periapsis rose above it energetic ions were no longer observed. The flux values are estimated in the spacecraft reference frame. The density is computed from the flux by dividing it by a speed corresponding to 40 eV.

The data values are constructed for UT times supplied by the Pioneer Venus Project.

ONMS-3  
(LR)

#### IV. Summary data tape.

The summary data tape was constructed in accordance with the recommendations of the Pioneer Venus archiving committee. A copy of that format is included for reference. The data tape has the following characteristics:

MEDIUM:	MAGNETIC TAPE
FORMAT:	ASCII
DENSITY:	1600 BPI
TRACKS:	9
PHYSICAL BLOCKSIZE:	3900 BYTES
LOGICAL RECORD SIZE:	78 BYTES
RECORDS/PHYSICAL BLOCK:	50
PHYSICAL RECORD TYPE:	FIXED BLOCK
TAPE LABEL:	UNLABELED
DENSITY:	1600 BPI
FORMAT:	ASCII
COMPUTER USED:	VAX 780

The orbits on the tape have been arranged sequentially. The format of the tape is briefly:

RECORD 1:

DESCRIPTION: number of variables and 4 character variable names

FORMAT: (I3,<N> (1X,A4)) where N=number of variables

RECORD 2:

DESCRIPTION: FORTRAN format of succeeding data records

FORMAT: (<M>A1) where M=number of bytes per logical record

RECORD 3:

DESCRIPTION: fill data definition for each data field

FORMAT: format contained in record 2

RECORD 4...:

DESCRIPTION: summary data

FORMAT: format contained in record 2

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The variables listed in RECORD 1 have the following are:

<u>VARIABLE</u>	<u>COMMENT</u>
DO+	Density of energetic atomic oxygen in cm <sup>-3</sup>
FO+	Flux of energetic atomic oxygen in cm <sup>-2</sup> s <sup>-1</sup>
FANG	Apparent angle, in degrees, of the ion flow in the ecliptic plane measured with respect to the sun
VALT	Altitude above the mean surface of Venus in km
VLAT	Venus latitude in degrees
VLST	Venus local solar time in hr
VSZA	Venus solar zenith angle in degrees

V. Description of microfiche plots.

Each orbit processed consists of 5 plots.

PAGE	COMMENT
1	Header page identifying the space-craft and instrument, orbit number, UT date and time of periapsis, and the principal investigator telephone and address .
2	Maximum pulse counts/sec for a selected set of mass numbers plotted versus time from periapsis; the data are multiplied by a factor in order to put them on a common vertical axis (the multipliers are indicated by the numbers following the X on the left hand side of the plot).
3	The 12 second average density for atomic oxygen plotted versus periapsis time.
4	The 12 second average flux for atomic oxygen plotted versus periapsis time.
5	The angle of the apparent atomic oxygen flow vector in the ecliptic plane.

Positional parameters for the data are available on the summary tape.

An example of a plot set has been included for reference.

VI. Energetic ion event list

A list of start and stop times for sections of the orbit where energetic ions have been observed for orbits 1 to 706 along with several location parameters for the spacecraft corresponding to these times. This list is included because the instrument was not optimally configured for measurement of energetic ions in this orbit range. Time limits were determined by a visual examination of the data.

ONMS-5  
(LR)

[26-FEB-90]

Several orbits of energetic ion data show individual points that that are erroneous and probably wrong.

ORBIT	LOW RESOLUTION DATA PERIAPSIS TIME TAG	UNIVERSAL TIME OF TIME TAG (ms)
3453	-180	8722030
	-168	8734030
3660	-576	10603177
	-564	10615177
	-468	10711177
	-456	10723177
	-336	10843177
3681	-648	10915226
	-636	10927226

High resolution data in the same time frame, plus or minus 12 seconds, is most likely wrong.

PIONEER VENUS ORBITER NEUTRAL MASS SPECTROMETER (ONMS)

Energetic Ion Location File

ORBITS 1 TO 706

A summary of the location of energetic ions detected by the ONMS instrument is given in this file. The file contains the start and stop times for each energetic ion segment. The file header description:

Name	Comment
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ORBIT	Orbit number
MS	Mass number of species (e.g. 16 would be nominally O+)
YYDDD	YY = last two digits of year DD = day of year
HH:MM:SS	HH = hour MM = minutes SS = seconds
PER TIM	Time from periapsis (sec)
ALT	Altitude in (km)
SZA	Solar zenith angle (deg)
LST	Local solar time (hr)

## PIONEER VENUS NEUTRAL MASS SPECTROMETER ENERGETIC ION EVENT LIST

ORBIT MS	START					FINISH									
	YYDDD	HH:MM:SS	PER	TIM	ALT	SZA	HOUR	YYDDD	HH:MM:SS	PER	TIM	ALT	SZA	HOUR	
1 16	78339	15: 6:35	-278.4	625.3	63.5	15.5	78339	15: 9:19	-114.2	420.8	62.8	15.9			
1 16	78339	15:13:26	133.3	436.2	64.8	16.3	78339	15:14:46	213.2	524.9	66.2	16.4			
3 16	78341	14:25:51	-356.3	624.0	66.4	15.5	78341	14:27: 2	-285.4	476.5	65.8	15.7			
6 16	78344	14:47:58	-496.8	976.0	70.6	15.3	78344	14:50:46	-328.8	544.8	69.5	15.9			
9 16	78347	15:15:22	-246.4	368.7	74.1	16.5	78347	15:16:59	-149.8	237.0	74.6	16.7			
9 16	78347	15:22:30	181.1	272.9	78.8	17.2	78347	15:22:43	194.6	290.5	79.0	17.3			
9 16	78347	15:23:44	255.6	384.3	80.1	17.3	78347	15:24:22	293.1	453.3	80.8	17.4			
9 16	78347	15:26: 0	391.4	672.0	82.7	17.5	78347	15:26: 0	391.4	672.0	82.7	17.5			
22 16	78360	17: 6: 1	-442.8	799.8	85.6	17.3	78360	17: 7: 3	-380.2	637.7	86.9	17.5			
26 16	78364	17:37:15	-506.2	984.1	87.9	17.4	78364	17:38:51	-410.5	715.5	90.4	17.8			
26 16	78364	17:40:31	-310.4	482.6	93.3	18.1	78364	17:41:55	-226.4	331.0	95.7	18.3			
27 16	78365	17:46:53	-407.4	708.6	91.6	17.9	78365	17:46:53	-407.4	708.6	91.6	17.9			
27 16	78365	18: 0:14	393.0	671.9	111.3	19.5	78365	18: 0:14	393.0	671.9	111.3	19.5			
27 16	78365	18: 6:28	767.2	1888.8	112.1	20.1	78365	18: 7:15	814.3	2071.8	112.0	20.1			
30 16	79003	18: 7: 8	-616.7	1331.5	88.2	17.3	79003	18: 7:39	-585.2	1225.1	89.1	17.5			
30 16	79003	18:30:17	773.0	1903.7	115.5	20.4	79003	18:45: 3	1658.4	5745.5	107.4	22.3			
32 16	79005	18:16:48	-633.9	1399.3	89.1	17.4	79005	18:16:48	-633.9	1399.3	89.1	17.4			
33 16	79006	18:39:19	423.2	749.9	120.7	20.2	79006	18:39:19	423.2	749.9	120.7	20.2			
38 16	79011	19: 6:30	596.3	1269.8	127.0	21.0	79011	19: 7:17	642.8	1429.3	126.4	21.1			
41 16	79014	19: 6: 4	-210.6	314.4	115.9	20.0	79014	19: 7:16	-138.6	227.4	119.4	20.2			
42 16	79015	19: 8:44	-309.5	490.7	112.0	19.9	79015	19:11: 2	-171.3	266.1	119.1	20.2			
42 16	79015	19:21:32	458.9	854.6	133.9	21.3	79015	19:22:31	517.7	1027.1	133.2	21.3			
43 16	79016	19:21:56	222.7	339.1	135.1	21.0	79016	19:24:17	363.7	612.4	136.0	21.2			
43 16	79016	19:28:38	625.6	1380.2	132.5	21.6	79016	19:30:28	735.5	1775.5	130.0	21.8			
44 16	79017	19:33:41	677.6	1551.1	132.4	21.8	79017	19:33:41	677.4	1550.4	132.4	21.8			
46 16	79019	19:41:22	713.3	1686.4	133.4	22.1	79019	19:42:56	807.3	2044.7	130.6	22.2			
49 16	79022	19:48:54	531.7	1073.8	141.7	22.1	79022	19:51:31	688.4	1602.6	136.8	22.4			
50 16	79023	19:55:43	728.9	1754.1	136.3	22.5	79023	19:57:41	846.6	2208.1	132.1	22.7			
52 16	79025	19:59:52	631.7	1389.9	141.2	22.6	79025	20: 4:19	898.4	2406.7	131.0	23.1			
54 16	79027	20: 3:44	573.5	1200.1	145.3	22.8	79027	20: 7:23	792.5	1988.7	136.1	23.1			
55 16	79028	20: 6:33	598.8	1287.2	145.0	22.9	79028	20: 6:57	622.0	1365.9	144.0	22.9			
56 16	79029	20: 4:15	316.0	508.8	156.9	22.6	79029	20: 8:33	574.0	1208.6	146.9	23.0			
57 16	79030	20: 8:35	431.3	787.3	153.9	22.9	79030	20:12:31	666.8	1528.3	143.2	23.2			
68 16	79041	20:15:55	448.1	819.0	159.0	0.1	79041	20:17:21	534.2	1072.6	153.0	0.2			
68 16	79041	20:20:36	729.9	1748.2	140.8	0.5	79041	20:21:24	777.1	1927.4	138.2	0.6			
70 16	79043	20:13: 7	322.3	519.2	168.4	0.1	79043	20:14: 6	380.9	652.2	163.8	0.2			
70 16	79043	20:18:38	653.6	1476.4	144.8	0.6	79043	20:22:15	870.1	2298.3	132.8	1.0			
77 16	79050	19:44:23	-905.0	2438.0	100.6	20.0	79050	19:46:12	-795.3	2000.4	106.2	21.0			
77 16	79050	19:54:40	-288.0	446.7	140.1	23.7	79050	19:56:13	-194.4	294.0	147.8	23.9			
77 16	79050	20: 3:33	245.7	371.1	167.8	0.7	79050	20: 6:10	402.5	702.8	157.4	1.0			
77 16	79050	20:10: 5	637.2	1416.8	141.9	1.4	79050	20:11:54	746.8	1814.8	135.6	1.5			
79 16	79052	20: 4:18	483.0	908.8	149.7	1.3	79052	20: 5:36	561.3	1150.1	144.7	1.5			
80 16	79053	19:59:54	368.9	606.2	156.1	1.3	79053	20: 0:41	415.9	723.6	153.1	1.3			
80 16	79053	20: 4:36	650.9	1454.2	138.6	1.7	79053	20: 5:38	713.5	1680.9	135.1	1.8			
82 16	79055	19:51:41	182.0	267.8	162.4	1.2	79055	19:53:33	293.6	448.1	157.9	1.4			
85 16	79058	19:49:27	524.0	1029.7	141.0	2.0	79058	19:52: 3	680.4	1557.1	132.4	2.3			
87 16	79060	19:38:30	264.5	389.6	151.7	1.8	79060	19:38:52	287.1	431.5	150.8	1.9			
87 16	79060	19:38:30	264.3	389.3	151.8	1.8	79060	19:38:54	288.3	433.8	150.8	1.9			
95 16	79068	19: 9: 9	189.5	284.7	141.5	2.6	79068	19: 9:41	221.6	329.9	140.7	2.6			
95 16	79068	19:10:53	294.2	456.0	138.4	2.7	79068	19:10:57	298.2	463.9	138.3	2.7			

95	16	79068	19:10:55	295.7	459.0	138.4	2.7	79068	19:11:10	310.8	489.3	137.8	2.8
98	16	79071	19: 3:53	523.5	1042.7	125.0	3.4	79071	19: 3:53	523.5	1042.7	125.0	3.4
104	16	79077	19:21:52	438.6	798.0	119.9	3.9	79077	19:23:42	548.4	1121.8	116.1	4.1
112	16	79085	20: 1: 6	624.1	1370.0	103.3	5.0	79085	20: 2: 9	686.7	1591.2	101.6	5.1
116	16	79089	19:54:50	-812.2	2064.4	106.6	1.2	79089	20: 3:19	-303.3	471.4	112.5	3.8
116	16	79089	20:13:29	307.1	479.0	105.7	5.0	79089	20:15:58	455.8	840.1	102.1	5.2
117	16	79090	20:17:32	287.8	440.1	104.6	5.0	79090	20:17:34	289.6	443.6	104.5	5.0
117	16	79090	20:17:33	289.3	443.0	104.5	5.0	79090	20:18:33	349.3	569.0	103.1	5.1
127	16	79100	20:58:57	257.9	380.1	89.6	6.0	79100	20:59:35	295.3	449.5	88.8	6.1
137	16	79110	21:22:47	-383.1	645.9	89.9	5.8	79110	21:23:50	-320.1	502.2	88.2	6.0
137	16	79110	21:25:47	-203.1	296.0	85.0	6.3	79110	21:25:47	-203.1	296.0	85.0	6.3
137	16	79110	21:34:34	323.2	508.8	72.9	7.2	79110	21:35:13	362.4	596.4	72.4	7.2
138	16	79111	21:23:50	-484.7	920.3	91.6	5.5	79111	21:24:37	-437.9	788.0	90.3	5.7
138	16	79111	21:18:21	-813.7	2068.5	98.6	3.5	79111	21:19: 8	-766.9	1886.8	97.7	3.9
138	16	79111	21:18:21	-813.5	2067.7	98.6	3.5	79111	21:19: 8	-766.7	1886.1	97.7	3.9
138	16	79111	21:36:54	299.2	460.1	71.7	7.3	79111	21:38:52	417.8	734.5	70.3	7.4
139	16	79112	21:28:36	-355.3	581.6	87.0	6.1	79112	21:28:48	-343.6	555.0	86.6	6.1
151	16	79124	21:36:45	-603.0	1297.7	84.8	6.3	79124	21:39:22	-446.5	816.8	78.1	7.0
151	16	79124	21:51:31	282.4	433.4	51.6	8.6	79124	21:51:42	293.5	454.9	51.4	8.6
151	16	79124	21:52: 6	318.1	504.6	51.3	8.7	79124	21:52: 6	318.1	504.6	51.3	8.7
152	16	79125	21:38:48	-444.9	814.6	77.1	7.2	79125	21:41:24	-288.9	448.5	69.6	7.6
161	16	79134	21:22:24	-411.9	735.0	67.0	8.2	79134	21:23:11	-365.0	619.7	64.2	8.4
162	16	79135	21:19:39	-413.1	741.4	66.1	8.3	79135	21:20:50	-342.9	572.9	61.9	8.5
162	16	79135	21:31: 9	276.7	438.6	34.5	9.8	79135	21:31:12	279.3	443.4	34.5	9.8
162	16	79135	21:31: 1	268.5	423.7	34.5	9.8	79135	21:31:12	280.0	444.7	34.5	9.8
164	16	79137	21:15: 1	-285.2	437.3	56.4	8.9	79137	21:15:59	-227.0	336.7	52.6	9.1
164	16	79137	21:23:17	211.0	312.6	31.8	9.9	79137	21:24:32	285.8	438.2	31.4	10.0
173	16	79146	20:31:16	-406.5	712.2	56.8	9.5	79146	20:31:16	-406.5	712.2	56.8	9.5
173	16	79146	20:42: 5	242.1	364.3	17.6	10.9	79146	20:42:41	278.7	428.4	18.1	11.0
175	16	79148	20:18:56	-382.9	661.3	53.6	9.8	79148	20:21:22	-237.1	365.3	42.5	10.2
175	16	79148	20:28:30	190.8	297.8	14.7	11.0	79148	20:28:56	217.4	335.0	14.5	11.1
185	16	79158	20:49:25	-513.9	1009.7	57.8	10.3	79158	20:54:51	-188.1	279.5	32.0	11.4
185	16	79158	21: 1:51	232.7	344.1	5.6	12.2	79158	21: 2:32	273.8	414.5	9.0	12.2
186	16	79159	20:57:21	-405.9	709.8	49.5	10.9	79159	20:57:45	-382.4	651.1	47.7	10.9
188	16	79161	21:10:42	-317.7	511.7	42.0	11.4	79161	21:12:54	-185.8	288.3	31.0	11.7
194	16	79167	21:42:13	-269.2	407.4	37.8	12.1	79167	21:43:18	-203.8	302.3	32.8	12.3
195	16	79168	21:45:26	-292.2	453.3	39.7	12.2	79168	21:46:28	-229.5	343.2	35.0	12.3
195	16	79168	21:54: 0	222.5	332.4	18.7	13.2	79168	21:54:39	261.2	395.9	20.4	13.3
198	16	79171	21:51:31	-525.3	1053.7	55.8	11.7	79171	21:52:57	-439.2	804.2	50.3	12.0
198	16	79171	22: 4:42	265.5	410.9	25.1	13.6	79171	22: 5:53	336.0	550.9	28.5	13.7
202	16	79175	22: 5:48	-246.3	366.0	39.4	13.1	79175	22: 6:36	-198.0	292.6	36.6	13.2
209	16	79182	22:11:45	-240.3	363.9	44.6	13.8	79182	22:12:47	-178.0	274.7	42.2	14.0
209	16	79182	22:18:50	184.7	283.0	39.9	14.7	79182	22:20:25	279.6	432.5	42.6	14.8
218	16	79191	22:11:35	-262.4	402.8	54.5	14.8	79191	22:12:36	-200.9	306.0	53.3	14.9
218	16	79191	22:19:29	212.3	322.1	54.9	15.7	79191	22:20:49	292.3	458.0	57.1	15.8
235	16	79208	21:59:48	-509.6	995.8	74.3	15.8	79208	21:59:48	-509.6	995.8	74.3	15.8
238	16	79211	22: 5: 8	-499.3	963.5	76.9	16.2	79211	22: 7:13	-373.6	623.8	77.8	16.6
297	16	79271	0:48:35	433.0	772.8	157.3	0.6	79271	0:48:35	432.9	772.6	157.3	0.6
316	16	79290	3: 3:59	496.9	960.9	133.7	2.7	79290	3: 5: 1	559.6	1155.1	130.6	2.8
320	16	79294	3:31:59	677.4	1559.5	120.7	3.4	79294	3:33: 2	740.2	1790.7	118.0	3.5
323	16	79297	3:45:57	402.1	702.8	128.4	3.3	79297	3:48:34	558.7	1155.3	122.0	3.5
334	16	79308	4:40:40	-328.7	527.4	119.5	3.1	79308	4:40:40	-328.7	527.4	119.5	3.1
334	16	79308	4:43:16	-172.7	264.0	121.3	3.5	79308	4:43:40	-148.7	237.2	121.4	3.5
334	16	79308	4:49: 8	179.3	272.1	118.3	4.1	79308	4:50:58	288.7	446.0	115.6	4.3

337	16	79311	5:10:50	408.7	714.9	107.8	4.8	79311	5:11:53	471.7	886.4	106.1	4.9
344	16	79318	5:51:29	402.5	694.8	96.7	5.6	79318	5:52:1	433.9	777.1	96.0	5.6
348	16	79322	6:13:51	405.2	699.2	91.6	5.9	79322	6:14:54	468.1	869.7	90.4	6.0
354	16	79328	6:45:58	446.0	806.0	82.8	6.6	79328	6:46:21	469.4	871.8	82.5	6.6
379	16	79353	7:37:57	-518.9	1021.5	77.5	7.2	79353	7:39:59	-397.7	681.4	71.5	7.6
379	16	79353	7:51:36	300.1	460.4	45.7	9.1	79353	7:52:15	339.1	542.5	45.6	9.1
382	16	79356	7:36:43	-491.5	946.9	73.5	7.6	79356	7:37:7	-468.1	879.2	72.2	7.7
382	16	79356	7:50:26	331.1	534.4	41.2	9.4	79356	7:51:29	394.1	681.2	41.6	9.5
384	16	79358	7:34:55	-498.8	974.0	72.1	7.8	79358	7:37:8	-365.6	618.7	64.7	8.3
384	16	79358	7:46:21	187.5	292.0	38.9	9.4	79358	7:47:59	284.8	447.4	38.1	9.6
386	16	79360	7:34:12	-429.3	784.9	66.4	8.3	79360	7:37:0	-261.3	412.0	56.3	8.8
386	16	79360	7:44:14	172.3	281.0	36.0	9.6	79360	7:45:37	255.3	401.7	35.0	9.7
402	16	80011	7: 1:43	-333.2	539.5	46.8	10.2	80011	7: 3:56	-200.0	301.8	36.1	10.6
403	16	80012	7: 7:56	-311.3	497.5	44.4	10.4	80012	7:10:10	-176.7	276.0	33.3	10.8
403	16	80012	7:16:32	204.5	312.3	9.0	11.5	80012	7:17:45	277.9	432.1	11.9	11.6
405	16	80014	7:18: 9	-389.0	680.6	49.2	10.4	80014	7:21:38	-180.1	288.6	32.2	11.0
405	16	80014	7:27:28	170.3	276.6	5.8	11.6	80014	7:29:45	307.7	497.8	12.6	11.8
410	16	80019	7:41:35	-368.1	620.7	45.3	11.0	80019	7:41:35	-368.1	620.7	45.3	11.0
414	16	80023	7:50:28	-689.7	1596.8	66.2	10.0	80023	7:58:11	-226.6	329.4	32.9	11.8
414	16	80023	8: 5: 5	188.1	274.4	9.6	12.6	80023	8: 6:29	272.1	406.3	14.7	12.8
423	16	80032	8: 1:52	-429.5	769.4	48.5	12.2	80032	8: 1:52	-429.5	769.4	48.5	12.2
434	16	80043	8:27:48	-247.5	381.4	44.8	13.9	80043	8:29: 7	-169.0	269.7	42.1	14.1
434	16	80043	8:34:53	177.6	280.1	41.1	14.7	80043	8:35:40	224.3	344.4	42.3	14.8
439	16	80048	8:47:23	-398.7	700.2	54.7	14.1	80048	8:47:59	-362.7	613.0	53.5	14.2
439	16	80048	8:59: 9	307.5	492.8	52.8	15.5	80048	8:59:24	323.0	524.9	53.4	15.5
444	16	80053	9: 5:56	-523.0	1046.8	62.2	14.2	80053	9: 6:19	-499.5	975.8	61.6	14.3
447	16	80056	9:36:12	597.6	1285.0	73.9	16.8	80056	9:36:12	597.6	1285.0	73.9	16.8
447	16	80056	9:17:48	-506.8	996.0	63.9	14.6	80056	9:18:59	-436.3	794.8	62.5	14.8
448	16	80057	9:23:37	-381.0	652.6	62.4	15.1	80057	9:23:37	-381.0	652.6	62.4	15.1
452	16	80061	9:34: 1	-598.4	1284.7	69.1	14.7	80061	9:34: 1	-598.4	1284.7	69.1	14.7
453	16	80062	9:39: 7	-488.8	938.9	68.5	15.3	80062	9:40:19	-416.8	739.1	67.8	15.5
461	16	80070	10: 3: 8	-405.2	704.3	76.2	16.4	80070	10: 3: 8	-405.2	704.3	76.2	16.4
461	16	80070	10:17:53	480.2	909.3	90.5	18.1	80070	10:17:53	480.2	909.3	90.5	18.1
462	16	80071	10: 6:40	-335.6	538.6	77.9	16.8	80071	10: 6:40	-335.6	538.6	77.9	16.8
464	16	80073	10: 9:13	-451.0	825.5	79.0	16.6	80073	10:12:23	-261.1	390.3	81.2	17.2
464	16	80073	10:21:57	313.1	490.0	92.0	18.2	80073	10:24:58	493.4	947.1	95.0	18.4
471	16	80080	10:20:47	-569.9	1185.5	83.9	16.9	80080	10:22:26	-470.9	882.0	85.8	17.3
471	16	80080	10:25:15	-301.6	467.0	89.5	17.8	80080	10:25:37	-279.4	424.0	90.1	17.9
472	16	80081	10:22:10	-594.2	1266.3	84.3	16.9	80081	10:24:31	-453.3	832.6	87.2	17.5
474	16	80083	10:25:41	-594.9	1269.5	85.9	17.1	80083	10:29:47	-348.2	568.3	92.0	18.0
474	16	80083	10:38: 6	150.3	236.6	105.1	19.0	80083	10:40: 6	270.5	409.7	107.2	19.2
479	16	80088	10:57:51	815.9	2082.1	115.1	20.6	80088	10:59:25	909.9	2459.7	114.2	20.7
490	16	80099	10:46:39	-700.4	1645.4	94.5	18.2	80099	10:48:54	-565.4	1179.3	100.3	19.0
490	16	80099	10:52:30	-349.4	579.7	110.6	19.7	80099	10:55:10	-189.5	292.4	118.5	20.1
490	16	80099	11: 0:44	143.8	239.8	131.0	20.7	80099	11: 5:35	434.8	791.5	132.5	21.2
490	16	80099	11: 7:53	573.5	1205.7	130.5	21.4	80099	11: 8:56	636.2	1416.8	129.3	21.5
496	16	80105	10:48:48	-590.7	1260.2	103.8	19.5	80105	10:50:48	-470.8	888.8	110.1	20.0
499	16	80108	11: 5:32	513.6	1001.3	142.2	22.3	80108	11: 5:32	513.6	1001.3	142.2	22.3
506	16	80115	10:58:24	741.4	1785.4	137.3	23.4	80115	11: 1: 1	897.8	2401.9	130.2	23.7
513	16	80122	10:29:41	216.3	309.4	168.6	23.3	80122	10:35:26	561.2	1150.6	148.6	23.9
520	16	80129	10: 6:47	550.7	1116.4	147.5	0.6	80129	10:10:18	762.5	1865.1	134.4	1.0
566	16	80175	12:51:39	-225.2	331.1	111.3	4.2	80175	12:52:47	-157.1	241.2	111.0	4.3
579	16	80188	13:58:53	-496.3	951.1	98.5	4.8	80188	13:58:53	-496.3	951.1	98.5	4.8
585	16	80194	14:26:33	-491.7	939.1	92.7	5.5	80194	14:28:24	-379.9	637.0	90.0	5.8

587	16	80196	14:35:23	-431.3	770.1	89.2	5.9	80196	14:36:35	-359.3	589.6	87.2	6.1
606	16	80215	15:32:41	-405.6	739.5	68.2	7.9	80215	15:33:30	-356.2	620.8	65.6	8.1
607	16	80216	15:32:30	-580.0	1249.7	76.3	7.4	80216	15:38:58	-191.9	327.4	55.6	8.6
607	16	80216	15:45:50	219.9	366.5	40.7	9.3	80216	15:46:39	269.4	447.4	40.3	9.4
608	16	80217	15:34:38	-615.1	1368.6	77.2	7.4	80217	15:39:57	-296.4	501.1	60.1	8.5
608	16	80217	15:48:31	217.7	366.7	39.1	9.4	80217	15:49:42	288.3	485.6	38.8	9.5
609	16	80218	15:40: 6	-450.9	867.5	67.8	8.1	80218	15:44:44	-173.4	311.6	52.0	8.8
609	16	80218	15:50:24	166.3	303.5	38.2	9.5	80218	15:51:13	215.7	367.5	37.5	9.5
612	16	80221	15:49:33	-378.8	693.1	60.7	8.7	80221	15:53:36	-135.8	283.6	45.9	9.2
612	16	80221	15:57:34	102.5	256.3	35.0	9.7	80221	16: 0:29	277.4	479.7	32.7	9.9
615	16	80224	15:58:21	-348.6	634.7	55.8	9.1	80224	16: 2:21	-108.6	273.2	40.4	9.6
615	16	80224	16: 5:25	75.1	252.0	31.1	9.9	80224	16: 7:13	189.1	347.0	28.4	10.1
616	16	80225	15:58:30	-506.4	1047.6	64.9	8.7	80225	15:58:54	-482.6	978.6	63.4	8.7
617	16	80226	16:12:45	181.3	353.1	25.2	10.3	80226	16:14:47	302.4	546.0	25.7	10.5
620	16	80229	16:10:35	-453.8	912.2	58.3	9.3	80229	16:12:35	-333.9	621.8	50.1	9.6
620	16	80229	16:21:54	224.9	424.5	20.4	10.7	80229	16:23:56	346.7	649.2	23.1	10.9
621	16	80230	16:15:29	-329.7	616.8	48.9	9.8	80230	16:16:31	-267.0	496.6	44.4	9.9
624	16	80233	16:21:17	-491.6	1030.8	57.9	9.6	80233	16:23:54	-333.9	637.0	46.7	10.1
624	16	80233	16:31:14	105.7	309.5	16.0	11.0	80233	16:33:25	236.4	458.4	14.7	11.2
625	16	80234	16:28: 9	-249.5	483.2	39.5	10.4	80234	16:29:10	-189.2	396.2	34.8	10.5
626	16	80235	16:31:10	-239.6	471.3	37.9	10.5	80235	16:34: 1	-69.2	296.4	24.4	10.9
628	16	80237	16:41:33	40.4	293.9	13.9	11.3	80237	16:45:46	293.5	571.7	12.8	11.7
629	16	80238	16:35:31	-493.2	1051.4	54.8	10.1	80238	16:39:37	-247.6	495.5	36.3	10.8
629	16	80238	16:33: 4	-640.4	1511.5	64.4	9.5	80238	16:33: 4	-640.3	1511.2	64.4	9.5
629	16	80238	16:48:45	301.1	589.7	12.0	11.8	80238	16:49: 1	317.0	620.8	13.9	11.8
631	16	80240	16:43:44	-344.8	685.5	42.8	10.8	80240	16:48:56	-32.9	304.0	16.9	11.5
631	16	80240	16:50:21	52.4	309.6	9.7	11.6	80240	16:52:48	199.1	432.3	4.8	11.9
632	16	80241	16:48:26	-234.7	486.2	33.4	11.2	80241	16:51:41	-40.0	309.5	16.9	11.6
633	16	80242	16:51: 1	-252.0	517.0	34.4	11.2	80242	16:54: 0	-73.2	325.8	19.3	11.6
633	16	80242	16:56:16	62.5	320.9	7.4	11.8	80242	16:57:52	158.5	391.6	0.9	12.0
636	16	80245	16:59:26	-265.0	548.3	34.4	11.5	80245	17: 0:33	-198.4	448.6	29.0	11.7
638	16	80247	17: 6:39	-178.3	430.6	27.1	11.9	80247	17: 9:19	-18.4	326.4	14.5	12.2
644	16	80253	17:21:57	-292.9	617.9	36.5	12.3	80253	17:22:59	-231.4	515.7	32.2	12.5
657	16	80266	17:56: 6	-441.3	961.8	50.7	13.3	80266	18: 0:14	-192.7	478.7	40.5	14.0
670	16	80279	18:30:23	-486.8	1080.4	61.6	14.6	80279	18:31:10	-439.7	954.5	60.6	14.8
670	16	80279	18:39:36	66.0	367.9	57.8	15.8	80279	18:43:47	316.5	674.5	63.3	16.2
671	16	80280	18:34:36	-391.9	836.3	60.6	15.0	80280	18:38: 6	-181.6	460.8	58.2	15.5
678	16	80287	18:54:57	-258.5	563.5	67.8	16.1	80287	18:56:57	-138.5	409.9	68.2	16.3
684	16	80293	19: 4:30	-601.0	1414.7	74.6	15.8	80293	19: 6: 4	-507.0	1128.7	74.6	16.1
692	16	80301	19:28:52	-347.1	724.8	85.0	17.4	80301	19:29: 3	-336.3	702.1	85.2	17.4
699	16	80308	19:41:31	-646.6	1565.6	86.4	17.2	80308	19:43:17	-540.0	1226.6	88.8	17.6
706	16	80315	20: 4:27	-342.4	727.8	102.5	18.9	80315	20: 4:37	-331.6	705.5	102.8	19.0

01-OCT-1987

TO: Kent Hills  
Code 633.0  
FROM: W. T. Kasprzak  
Code 615.1  
SUBJECT: Energetic ion data from the Pioneer Venus Orbiter  
Neutral Mass Spectrometer (ONMS)  
Updated energetic ion data tape

The tape, microfiche and assorted documentation represent a  
an added section of energetic processed data from the ONMS  
instrument. The magnetic tape contains data for orbit 1 to  
2043 and replaces the previous energetic ion data tape  
submitted on 20-AUG-1987. Note that this does not replace the  
neutral density measurement data from the same instrument  
(ONMS). This new tape refers to measurements of energetic  
ions. Both measurement types occurred during the first 645  
orbits and therefore overlap. The microfiche contains the  
plots for orbits 1134 to 2043 and therefore is an addition to  
the previous set of microfiche submitted and does not replace  
it.

A tape dump of the first few blocks has been included for  
reference.

Any questions or problems with the data or the data tape  
should be communicated to:

H. B. Niemann	301-286-8706
W. T. Kasprzak	301-286-8253

## PV DMNS ENERGETIC TUN DATA FOR NSSDC

AN ASTERISK (\*) INDICATES NO UADS DATA FOR THE ORBIT

0001	0003	0006*	0009	0022*	0026*	0027*	0036*	0032*	0038*	0041
0042	0043*	0044*	0046*	0049*	0050*	0052*	0054*	0055*	0056	0057*
0068*	0070	0077	0079*	0080*	0082	0085*	0087*	0095*	0098*	0104*
0116*	0117*	0127*	0137*	0138*	0139*	0151*	0152*	0161*	0162*	
0117	0173	0175	0185	0186*	0188	0194	0195	0198*	0202	0209
0218	0235*	0238*	0297*	0334	0354*	0379	0382*	0384	0402*	0403
0405	0410*	0414	0423*	0434	0439*	0444*	0447*	0448*	0452*	0453
0461*	0462*	0464	0471	0472*	0474	0479*	0490	0496	0499*	0506*
0513*	0520*	0566	0579*	0585	0587	0606	0607	0608	0609	0612
0615	0616*	0617	0620	0621	0624	0625*	0629*	0631	0632*	0633
0636	0638	0644	0935	0937	0939	0946	0949	0951	0953	0954
0956	0958	0967	0968	0970	0974	0975	0979	0981	0982	0986
0991	0998	1000	1003*	1005	1007	1016	1017	1019	1023	1024*
1030	1031	1035*	1037*	1038*	1040*	1042	1044*	1047	1049*	1054*
1056	1065	1066*	1068*	1072*	1073*	1077	1079*	1080*	1089*	1093
1096	1098*	1103*	1105	1115*	1121	1122*	1126*	1128*	1129*	1133*
1140	1145	1147*	1150*	1152*	1154	1163*	1164	1166	1170	1171
1175	1177	1114*	1182	1187	1189	1191	1194	1196	1199	1201
1203	1212	1213	1215	1219	1220	1224	1227	1231	1236	1238*
1240	1243*	1245	1248	1250	1252	1261*	1262*	1264*	1268*	1269*
1273*	1275*	1276	1280*	1285*	1287*	1289*	1292*	1294*	1297*	1299*
1301*	1310*	1313*	1317*	1318*	1322*	1324*	1325*	1329*	1334*	1336*
1338*	1341*	1343*	1346*	1348*	1350*	1359*	1360*	1362*	1366*	1367
1371*	1373	1374*	1378*	1383	1385*	1387	1390	1392	1395	1397
1399	1408	1409	1411*	1446	1448	1457*	1458	1460*	1464*	1465*
1469*	1471*	1472*	1476*	1481*	1483*	1485*	1488*	1490*	1492*	1495*
1497*	1506*	1507*	1509*	1513*	1514*	1518*	1520*	1521*	1525*	1530*
1531*	1532*	1533*	1534*	1537*	1539*	1542*	1544*	1546*	1555*	1556*
1558*	1562*	1563*	1567*	1569*	1570*	1574*	1579*	1581*	1583*	1586*
1593*	1595*	1604*	1605	1607	1611	1612*	1614*	1616	1618	
1623	1628	1630	1632	1635	1637	1640	1642	1644	1653	1654
1656	1661	1665	1667	1668	1672	1677	1679*	1681	1684*	1686*
1689*	1691*	1693*	1702*	1703*	1705*	1709*	1710*	1716*	1717*	1721*
1726*	1728*	1730*	1733*	1735*	1738*	1740*	1742*	1751*	1752*	1754*
1758*	1759*	1763*	1765*	1766	1770*	1775*	1777*	1779*	1782*	1784*
1787*	1789*	1791*	1800*	1801*	1803*	1807*	1814*	1828*	1831*	1833*
1840*	1847	1850	1857*	1864	1868	1871	1875	1878	1882	1885
1892	1896	1899*	1906*	1913*	1920*	1924*	1927*	1931*	1934*	1938*
1941*	1948*	1952*	1955*	1959*	1962*	1966*	1969*	1976*	1983*	1987*
1994*	1997*	2036*	2039*	2043*						

ORBIT	DATE	TYPE	COMMENTS	EOT	EON	LED	UTP	OUP	PLT
***** NEUT, RPR, FILA OFF DATA WITH TIME SELECTED FROM ENERGETIC ION ***** MARKING FILE									
0001	30-DEC-86	EDR	INBOUND AND OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0003	30-DEC-86	EDR	INBOUND DATA	YES	YES	YES	YES	YES	YES
0006	30-DEC-86	EDR	INBOUND DATA	YES	NO	NO	YES	YES	YES
0009	30-DEC-86	EDR	INBOUND AND OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0022	31-DEC-86	EDR	ISOLATED POINTS ON INBOUND	YES	NO	NO	YES	YES	YES
0026	31-DEC-86	EDR	INBOUND DATA, SPARSE	YES	NO	NO	YES	YES	YES
0027	31-DEC-86	EDR	1 ISOLATED POINT	YES	NO	NO	YES	YES	YES
0030	31-DEC-86	EDR	SEVERAL ISOLATED POINTS	YES	NO	NO	YES	YES	YES
0032	07-JAN-87	EDR	1 POINT ONLY	YES	NO	NO	NO	YES	YES
0033	07-JAN-87	EDR	1 POINT ONLY	NO	NO	NO	NO	NO	NO
0038	07-JAN-87	EDR	2 ISOLATED POINTS NRPA DATA ONLY	YES	NO	NO	NO	YES	YES
0041	07-JAN-87	TYM	INBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
0042	07-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0043	07-JAN-87	EDR	NRPA DATA ONLY	YES	NO	NO	NO	YES	YES
0044	14-JAN-87	EDR	1 POINT OUT BOUND NRPA	YES	NO	NO	NO	YES	YES
0046	20-JAN-87	EDR	NRPA OUTBOUND DATA ONLY	YES	NO	NO	YES	YES	YES
0049	14-JAN-87	EDR	ISOLETED POINTS NRPA OUTBOUND	YES	NO	NO	NO	YES	YES
0050	14-JAN-87	EDR	ISOLETED POINTS NRPA OUTBOUND	YES	NO	NO	NO	YES	YES
0052	14-JAN-87	EDR	ISOLETED POINTS NRPA OUTBOUND	YES	NO	NO	NO	YES	YES
0054	14-JAN-87	EDR	ISOLETED POINTS NRPA OUTBOUND	YES	NO	NO	NO	YES	YES
0055	14-JAN-87	EDR	SEVERAL POINTS NRPA OUTBOUND	YES	NO	NO	NO	YES	YES
56	14-JAN-87	EDR	SEVERAL POINTS NRPA OUTBOUND	YES	YES	YES	NO	YES	YES
0057	14-JAN-87	EDR	ISOLATED POINTS NRPA OUTBOUND	YES	NO	NO	NO	YES	YES
0068	14-JAN-87	EDR	ISOLATED POINTS NRPA OUTBOUND	YES	NO	NO	NO	YES	YES
0070	14-JAN-87	EDR	1 POINT RPA OUTBOUND	YES	YES	YES	NO	YES	YES
0077	14-JAN-87	EDR	INBOUND RPA/ISOLATED POINTS IN NRPA OUTBOUND	YES	YES	YES	NO	YES	YES
0079	14-JAN-87	EDR	ISOLATED POINTS NRPA MODE OUTBOUND	YES	NO	NO	NO	YES	YES
0080	20-JAN-87	EDR	ISOLATED POINTS OUTBOUND ONLY	YES	NO	NO	YES	YES	YES
0082	20-JAN-87	EDR	ISOLATED POINTS OUTBOUND ONLY	YES	YES	YES	YES	YES	YES
0085	20-JAN-87	EDR	ISOLATED POINTS OUTBOUND ONLY	YES	NO	NO	YES	YES	YES
0087	20-JAN-87	EDR	OUTBOUND DATA ONLY	YES	YES	NO	YES	YES	YES
0095	20-JAN-87	EDR	OUTBOUND DATA ONLY	YES	YES	NO	YES	YES	YES
0098	20-JAN-87	EDR	NRPA DATA OUTBOUND ONLY	YES	NO	NO	YES	YES	YES
0104	20-JAN-87	EDR	ISOLATED POINTS OUTBOUND ONLY	YES	NO	NO	YES	YES	YES
0112	20-JAN-87	EDR	ISOLATED POINTS OUTBOUND ONLY	YES	NO	NO	YES	YES	YES
0116	20-JAN-87	EDR	ION MODE INBOUND & OUTBOUND	YES	NO	NO	YES	YES	YES
0117	26-FEB-87	EDR	FEW ISOLATED POINTS	YES	NO	NO	YES	YES	YES
0127	26-FEB-87	EDR	FEW ISOLATED POINTS	YES	YES	NO	YES	YES	YES
0137	20-JAN-87	EDR	ONE POINT	YES	NO	NO	YES	YES	YES
0138	30-JAN-87	EDR	FEW ISOLATED POINTS RPA MODE	YES	YES	NO	YES	YES	YES
0139	20-JAN-87	EDR	NRPA MODE ONLY	YES	NO	NO	YES	YES	YES
0151	30-JUN-87	EDR	INBOUND AND SEVERAL POINTS OUTBOUND	YES	YES	YES	YES	YES	YES
0152	30-JUN-87	EDR	INBOUND ONLY	YES	YES	YES	YES	YES	YES
161	30-JAN-87	EDR	FEW ISOLATED POINTS RPA MODE	YES	NO	NO	YES	YES	YES
32	30-JAN-87	EDR	FEW ISOLATED POINTS RPA MODE	YES	NO	NO	YES	YES	YES
0164	30-JAN-87	EDR	INBOUND/OUTBOUND RPA MODE	YES	YES	YES	YES	YES	YES
0173	30-JAN-87	EDR	OUTBOUND RPA DATA	YES	YES	YES	YES	YES	YES
0175	30-JAN-87	EDR	INBOUND/OUTBOUND RPA DATA	YES	YES	YES	YES	YES	YES
0185	30-JAN-87	EDR	INBOUND/OUTBOUND RPA DATA	YES	YES	YES	YES	YES	YES

0186	10-FEB-87	EDR	2 ISOLATED POINTS	YES	NO	NO	YES	YES	YES
0188	10-FEB-87	EDR	INBOUND DATA	YES	YES	YES	YES	YES	YES
0194	10-FEB-87	EDR	INBOUND DATA	YES	YES	YES	YES	YES	YES
195	10-FEB-87	EDR	INBOUND/OUTBOUND DATA	YES	YES	YES	YES	YES	YES
198	10-FEB-87	EDR	1 ISOLATED POINTS INBOUND SEVERAL POINTS OUTBOUND	YES	NO	NO	YES	YES	YES
0202	10-FEB-87	EDR	INBOUND DATA	YES	YES	YES	YES	YES	YES
0209	10-FEB-87	EDR	INBOUND/OUTBOUND	YES	YES	YES	YES	YES	YES
0218	10-FEB-87	EDR	INBOUND/OUTBOUND	YES	YES	YES	YES	YES	YES
0235	10-FEB-87	EDR	1 POINT INBOUND	YES	NO	NO	YES	YES	YES
0238	10-FEB-87	EDR	SEVERAL ISOLATED POINTS INBOUND	YES	NO	NO	YES	YES	YES
0297	16-MAR-87	EDR	ONE ISOLATED POINT	YES	NO	NO	YES	YES	YES
0316	16-MAR-87	EDR	SEVERAL ISOLATED POINTS	NO	NO	NO	NO	NO	YES
0320	16-MAR-87	EDR	SEVERAL ISOLATED POINTS	NO	NO	NO	NO	NO	YES
0323	16-MAR-87	EDR	ISOLATED POINTS	NO	NO	NO	NO	NO	YES
0334	16-MAR-87	EDR	INBOUND/OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0337	16-MAR-87	EDR	SEVERAL ISOLATED POINTS OUTBOUND	NO	NO	NO	NO	NO	YES
0344	26-MAR-87	EDR	ION MODE DATA SEVERAL ISOLATED POINTS	NO	NO	NO	NO	NO	YES
0348	26-MAR-87	EDR	ION MODE DATA SEVERAL ISOLATED POINTS	NO	NO	NO	NO	NO	YES
0354	26-MAR-87	EDR	OUTBOUND DATA SEVERAL ISOLATED POINTS	YES	NO	NO	YES	YES	YES
0379	26-MAR-87	EDR	INBOUND DATA	YES	YES	YES	YES	YES	YES
0382	26-MAR-87	EDR	INBOUND/OUTBOUND SEVERAL ISOLATED POINTS	YES	NO	NO	YES	YES	YES
0384	26-MAR-87	EDR	INBOUND/OUTBOUND DATA	YES	YES	YES	YES	YES	YES
186	26-MAR-87	EDR	NO ATTITUDE DATA	NO	NO	NO	NO	NO	YES
402	26-MAR-87	EDR	SEVERAL ISOLATED POINTS INBOUND	YES	NO	NO	YES	YES	YES
0403	26-MAR-87	EDR	INBOUND/OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0405	26-MAR-87	EDR	INBOUND/OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0410	26-MAR-87	EDR	SEVERAL ISOLATED POINTS INBOUND	YES	NO	NO	YES	YES	YES
0414	13-APR-87	EDR	INBOUND DATA	YES	YES	YES	YES	YES	YES
0423	13-APR-87	EDR	1 ISOLATED POINT INBOUND	YES	NO	NO	YES	YES	YES
0434	13-APR-87	EDR	INBOUND/OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0439	13-APR-87	EDR	INBOUND DATA	YES	YES	YES	NO	YES	YES
0444	13-APR-87	EDR	FEW ISOLATED POINTS INBOUND	YES	NO	NO	YES	YES	YES
0447	13-APR-87	EDR	FEW ISOLATED POINTS INBOUND	YES	NO	NO	YES	YES	YES
0448	13-APR-87	EDR	1 ISOLATED POINT INBOUND	YES	NO	NO	YES	YES	YES
0452	13-APR-87	EDR	1 ISOLATED POINT INBOUND	YES	NO	NO	YES	YES	YES
0453	13-APR-87	EDR	INBOUND DATA	YES	YES	YES	YES	YES	YES
0461	13-APR-87	EDR	1 ISOLATED POINT INBOUND OUTBOUND	YES	NO	NO	YES	YES	YES
0462	13-APR-87	EDR	1 ISOLATED POINT INBOUND	YES	NO	NO	YES	YES	YES
0464	15-APR-87	EDR	INBOUND/OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0471	15-APR-87	EDR	INBOUND ONLY	YES	YES	YES	YES	YES	YES
0472	15-APR-87	EDR	ISOLATED POINTS	YES	NO	NO	YES	YES	YES
0474	15-APR-87	EDR	INBOUND/OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0479	15-APR-87	EDR	SEVERAL ISOLATED POINTS OUTBOUND	YES	NO	NO	YES	YES	YES
0490	15-APR-87	EDR	INBOUND/OUTBOUND DATA	YES	YES	YES	YES	YES	YES
96	15-APR-87	EDR	INBOUND ONLY	YES	YES	YES	YES	YES	YES
U499	15-APR-87	EDR	ISOLATED POINTS OUTBOUND	YES	NO	NO	YES	YES	YES
0506	15-APR-87	EDR	OUTBOUND ONLY	YES	NO	NO	YES	YES	YES
0513	15-APR-87	EDR	OUTBOUND SCATTERED POINTS	YES	NO	NO	YES	YES	YES
0520	15-APR-87	EDR	ISOLATED POINTS	YES	NO	NO	YES	YES	YES

0566	17-APR-87	EDR	INBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
0579	17-APR-87	EDR	1 ISOLATED POINT	YES	NO	NO	YES	YES	YES
0585	17-APR-87	EDR	INBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
1587	17-APR-87	EDR	INBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
1506	17-APR-87	EDR	INBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
0607	17-APR-87	EDR	INBOUND AND OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0608	17-APR-87	EDR	INBOUND AND OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0609	17-APR-87	EDR	INBOUND AND OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0612	17-APR-87	EDR	INBOUND AND OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0615	17-APR-87	EDR	INBOUND AND OUTBOUND DATA	YES	YES	YES	YES	YES	YES
0616	17-APR-87	EDR	SEVERAL ISOLATED PNTS INBOUND	YES	YES	NO	YES	YES	YES
0617	17-APR-87	EDR	OUTBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
0620	20-APR-87	EDR	INBOUND/OUTBOUND	YES	YES	YES	YES	YES	YES
0621	20-APR-87	EDR	INBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
0624	20-APR-87	EDR	INBOUND/OUTBOUND	YES	YES	YES	YES	YES	YES
0625	20-APR-87	EDR	INBOUND DATA ONLY	YES	NO	NO	YES	YES	YES
0626	20-APR-87	EDR	INBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
0628	20-APR-87	EDR	OUTBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
0629	20-APR-87	EDR	INBOUND/OUTBOUND DATA	YES	NO	NO	YES	YES	YES
0631	20-APR-87	EDR	INBOUND/OUTBOUND FILA B	YES	YES	YES	YES	YES	YES
0632	20-APR-87	EDR	INBOUND DATA ONLY	YES	NO	NO	YES	YES	YES
0633	20-APR-87	EDR	INBOUND/OUTBOUND	YES	YES	YES	YES	YES	YES
0636	20-APR-87	EDR	INBOUND DATA ONLY	YES	NO	NO	YES	YES	YES
0638	20-APR-87	EDR	INBOUND DATA ONLY	YES	YES	YES	YES	YES	YES
0644	20-APR-87	EDR	FEW POINTS INBOUND	YES	YES	YES	YES	YES	YES

\*\*\*\*\* FOR ORBITS 935 AND UP NEUT, NRPA, FILA OFF DATA WILL BE USED \*\*\*\*\*

0935	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0937	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0939	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0946	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0949	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0951	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0953	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0954	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0956	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0958	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0967	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0968	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0970	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0974	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0975	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0979	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0981	15-JAN-87	EDR		YES	YES	YES	YES	YES	YES
0982	20-APR-87	EDR		YES	YES	YES	YES	YES	YES
0986	20-APR-87	EDR		YES	YES	YES	YES	YES	YES
0991	20-APR-87	EDR		YES	YES	YES	YES	YES	YES
0998	20-APR-87	EDR		YES	YES	YES	YES	YES	YES
1000	20-APR-87	EDR		YES	YES	YES	YES	YES	YES
1003	20-APR-87	EDR		YES	YES	NO	YES	YES	YES
1005	20-APR-87	EDR		YES	YES	YES	YES	YES	YES
1007	27-APR-87	EDR		YES	YES	YES	YES	YES	YES
1016	27-APR-87	EDR		YES	YES	YES	YES	YES	YES
1017	27-APR-87	EDR		YES	YES	YES	YES	YES	YES
1519	29-APR-87	EDR		YES	YES	YES	YES	YES	YES
1023	27-APR-87	EDR		YES	YES	YES	YES	YES	YES
1024	27-APR-87	EDR		YES	NO	NO	YES	YES	YES
1028	27-APR-87	EDR	NO DATA FROM -1000<TP<1000	NO	NO	NO	NO	YES	YES
1030	27-APR-87	EDR		YES	YES	YES	YES	YES	YES

1031	27-APR-87	EDR	YES	YES	YES	YES	YES	YES
1035	27-APR-87	EDR	YES	NO	NO	YES	YES	YES
1037	27-APR-87	EDR	YES	NO	NO	YES	YES	YES
1038	27-APR-87	EDR	YES	NO	NO	YES	YES	YES
1040	27-APR-87	EDR	YES	NO	NO	YES	YES	YES
1042	27-APR-87	EDR	YES	YES	YES	YES	YES	YES
1044	27-APR-87	EDR	YES	NO	NO	YES	YES	YES
1047	27-APR-87	EDR	YES	YES	YES	YES	YES	YES
1049	27-APR-87	EDR	YES	NO	NO	YES	YES	YES
1052	27-APR-87	EDR	YES	NO	NO	YES	YES	YES
1054	27-APR-87	EDR	YES	NO	NO	YES	YES	YES
1056	13-MAY-87	EDR	YES	YES	YES	YES	YES	YES
1065	13-MAY-87	EDR	YES	YES	YES	YES	YES	YES
1066	13-MAY-87	EDR	YES	NO	NO	YES	YES	YES
1068	13-MAY-87	EDR	YES	NO	NO	YES	YES	YES
1072	13-MAY-87	EDR	YES	NO	NO	YES	YES	YES
1073	13-MAY-87	EDR	YES	NO	NO	YES	YES	YES
1077	13-MAY-87	EDR	YES	YES	YES	YES	YES	YES
1079	13-MAY-87	EDR	YES	NO	NO	YES	YES	YES
1080	13-MAY-87	EDR	YES	NO	NO	YES	YES	YES
1084	13-MAY-87	EDR	YES	YES	YES	YES	YES	YES
1089	13-MAY-87	EDR	YES	NO	NO	YES	YES	YES
1093	13-MAY-87	EDR	YES	YES	YES	YES	YES	YES
1096	13-MAY-87	EDR	YES	YES	YES	YES	YES	YES
1098	13-MAY-87	EDR	YES	NO	NO	YES	YES	YES
1103	13-MAY-87	EDR	YES	NO	NO	YES	YES	YES
1105	05-JUN-87	EDR	YES	YES	YES	YES	YES	YES
1114	05-JUN-87	EDR	YES	NO	NO	YES	YES	YES
1115	05-JUN-87	EDR	YES	NO	NO	YES	YES	YES
121	05-JUN-87	EDR	YES	YES	YES	YES	YES	YES
122	05-JUN-87	EDR	YES	NO	NO	YES	YES	YES
1126	05-JUN-87	EDR	YES	NO	NO	YES	YES	YES
1128	05-JUN-87	EDR	YES	NO	NO	YES	YES	YES
1129	05-JUN-87	EDR	YES	NO	NO	YES	YES	YES
1133	05-JUN-87	EDR	YES	NO	NO	YES	YES	YES
1138	04-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1140	04-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1145	04-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1147	04-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1150	04-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1152	04-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1154	04-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1163	04-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1164	04-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1166	04-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1170	04-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1171	04-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1175	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1177	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1178	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1182	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1187	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1189	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1191	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1194	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
96	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1199	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1201	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1203	05-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1212	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES

1213	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1215	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1219	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1220	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1224	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1227	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1231	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1236	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1238	10-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1240	10-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1243	10-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1245	11-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1248	11-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1250	11-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1252	11-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1261	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1262	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1264	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1268	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1269	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1273	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1275	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1276	11-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1280	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1285	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1287	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1289	11-AUG-87	EDR	YES	YES	NO	YES	YES	YES
1292	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1294	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1297	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1299	11-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1301	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1310	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1313	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1317	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1318	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1322	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1324	13-AUG-87	EDR	YES	YES	NO	YES	YES	YES
1325	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1329	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1334	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1336	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1338	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1341	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1343	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1346	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1348	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1350	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1359	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1360	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1362	13-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1366	19-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1367	19-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1371	19-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1373	19-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1374	19-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1378	19-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1383	19-AUG-87	EDR	YES	YES	YES	YES	YES	YES
1385	19-AUG-87	EDR	YES	NO	NO	YES	YES	YES
1387	19-AUG-87	EDR	YES	YES	YES	YES	YES	YES



1591	24-AUG-87	EDR		YES	NO	NO	YES	YES	YES
1593	24-AUG-87	EDR		YES	NO	NO	YES	YES	YES
1595	24-AUG-87	EDR		YES	NO	NO	YES	YES	YES
1604	24-AUG-87	EDR		YES	NO	NO	YES	YES	YES
1605	24-AUG-87	EDR		YES	YES	YES	YES	YES	YES
1607	24-AUG-87	EDR		YES	YES	YES	YES	YES	YES
1611	24-AUG-87	EDR		YES	YES	YES	YES	YES	YES
1612	26-AUG-87	EDR		YES	NO	NO	YES	YES	YES
1614	26-AUG-87	EDR		YES	NO	NO	YES	YES	YES
1616	26-AUG-87	EDR		YES	YES	YES	YES	YES	YES
1618	26-AUG-87	EDR		YES	YES	YES	YES	YES	YES
1619	26-AUG-87	EDR	O DATA; DATAGAP -340<TP<1200 S	NO	NO	NO	NO	YES	YES
1623	26-AUG-87	EDR		YES	YES	YES	YES	YES	YES
1628	26-AUG-87	EDR		YES	YES	YES	YES	YES	YES
1630	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1632	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1635	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1637	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1640	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1642	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1644	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1653	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1654	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1656	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1661	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1665	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1667	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1668	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1672	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1677	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1679	02-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1681	02-SEP-87	EDR		YES	YES	YES	YES	YES	YES
1684	02-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1686	02-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1689	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1691	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1693	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1702	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1703	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1705	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1709	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1710	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1716	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1717	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1719	04-SEP-87	EDR	NO DATA FOR THIS ORBIT	NO	NO	NO	NO	NO	NO
1721	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1726	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1728	04-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1730	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1733	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1735	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1738	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1740	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1742	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1751	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1752	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1754	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1758	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1759	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES
1763	08-SEP-87	EDR		YES	NO	NO	YES	YES	YES

1765	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1766	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1770	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
775	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
77	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1779	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1782	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1784	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1787	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1789	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1791	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1800	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1801	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1803	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1807	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1814	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1828	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1831	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1833	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1840	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1847	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1850	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1857	08-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1864	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1868	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1871	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1875	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1878	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1882	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
85	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1892	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1896	08-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1899	11-SEP-87	EDR	YES	YES	YES	YES	YES	YES
1906	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1910	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1913	11-SEP-87	EDR	NO	NO	NO	NO	NO	NO
1920	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1924	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1927	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1931	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1934	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1938	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1941	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1948	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1952	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1955	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1959	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1962	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1966	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1969	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1976	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1983	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1987	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1994	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
1997	11-SEP-87	EDR	YES	NO	NO	YES	YES	YES
36	16-SEP-87	EDR	YES	NO	NO	NO	YES	YES
2039	16-SEP-87	EDR	YES	NO	NO	NO	YES	YES
2043	16-SEP-87	EDR	YES	NO	NO	NO	YES	YES

NO DATA FOR THIS ORBIT

## Purpose of Revised Pioneer Venus NSSDC Data Format

1. standardize and improve the data formats for each experiment so that the tapes can be easily read by a requestor.
2. store the data by experiment,
3. provide for orderly updating of data,
4. provide for ultimate replacement of existing UADS generated archival tapes.

A new format was designed which is to be used by each experimenter for PVO NSSDC data experimenter, and can be easily read by computers expected to be accessible to a requester. One major difference between this and the existing LFD format is the use of text (ASCII) data formats, eliminating both binary and IBM floating point formats.

The proposed new submission format is self-defining in the sense that the first three records on each tape define the data parameters, value representations, and missing data (file) indicators. The first tape record defines the order in which the variables appear in the subsequent data records, in a manner similar to that used for SEDR trajectory data (SEDR file 5). The second tape record will contain a FORTRAN-compatible format list describing the field sizes and representations of each data value in the order defined in record 1. This format may be used to decode all subsequent records on the tape.

The third tape record will define a unique value associated with filler (missing) data for all variable fields. It is formatted according to the format used in record 2, and is immediately followed by the start of actual data records (records 4 and beyond).

The following is the proposed new format, with examples as applied to OETP instructions.

### PROPOSED PIONEER VENUS NSSDC LOW-FREQUENCY DATA FORMAT

This document describes a suggested format to be used by all investigators for the submission of their data to the National Space Sciences Data Center. The overall specification will require that all data be coded into ASCII, and written onto standard 1/2 inch 1600-bpi 9-track tapes. The logical record length will be fixed for a given tape, as well as the physical blocksize. Blocksizes should be large enough to avoid wasting tape, but should not exceed 8000 bytes in order to avoid making excessive demands on user programs for memory. The first three records of any of these tapes will be formatted as follows:

Record 1: The format to be used is ~~(I3,n(1X,A4))~~ where "n" is the number of data items in each record.

* 4	ELTE	ELNE	MI	VS					(for OETP)
7	ETEM	SPOT	TONE	TTWO	XVEL	YVEL	ZVEL		(for ORPA)
↑	↑	↑	↑	↑	↑	↑	↑		
3	5	10	15	20	25	30	35		

Example 1: The first record in each tape file. Note that new value types with new 4-character designations can be added as necessary. The date, time, orbit and time-tag items are not included in the list, because they are common to all data records.

\* number of data items "n"

Record 2: This record contains the format in which all succeeding records are written. The first 4 format items specify the date, time, orbit, and time-tag, and will appear in the same format on all tapes.

(I8,I9,I5,I6,4F9.2)	(Appropriate for OETP)
↑	
1	

Example 2: The second record in each tape file

Record 3: This record will contain zeroes for the first four fields (date, time, orbit, and time-tag), and in addition will have a fill value in each data value location. This value will be used by any program reading the data to identify fill data in subsequent input records.

0	0	0	0999999.99999999.99999999.99999999.99				
↑	↑	↑	↑	↑	↑	↑	↑
8	17	22	28	37	46	55	64

Example 3: The third record in each tape file. (Appropriate for OETP).

Record 4 to : These records contain the date, time, orbit, and time-tag for each time which has any non-fill data.

1981207	43527786	879	-1788	2345.67	78543.89999999.99	16.20
↑	↑	↑	↑	↑	↑	↑
8	17	22	28	37	46	55
						64

Example 4: All records after the third in a tape file. (Appropriate for OETP).

As can be inferred from the above example, the date is coded as YEAR, DAY OF YEAR (1-366) with 19 included in the year. The time is in milliseconds of the day, orbit number is self-explanatory, and the time tag is the usual value ranging of the day from -1800 to 1800 in increments of 12.

The project-provided tape of SEDR information would be the source of the official dates and times to be used by all other investigators.

Nothing in the above format would preclude investigators from producing a tape containing the data from more than one experiment.

The external label on the tape should be type-written, and contain the following information:

- o Full name of experiment data contained on tape.<sup>1</sup>
- o Start date, time, and orbit number of data on the tape.
- o Stop date, time, and orbit number of data on the tape.
- o Production date of the tape.
- o The density (1600-bpi) and number of tracks (9) at which the tape was recorded.
- o An estimate of the amount of tape used.
- o The physical blocksize used in writing the tape.
- o A name and phone number of the individual responsible for the tape.

---

<sup>1</sup> Example: "Pioneer Venus Orbiter Electron Temperature Probe".

# PIONEER VENUS

ORBITER NEUTRAL MASS SPECTROMETER

ORBIT DATE UT PERIAPSIS

113491 0100 0100  
113491 0100 0100  
8511 0100 0100  
1105 0100 0100

COMMENTS:

H. B. NIEMANN 301-286-8706

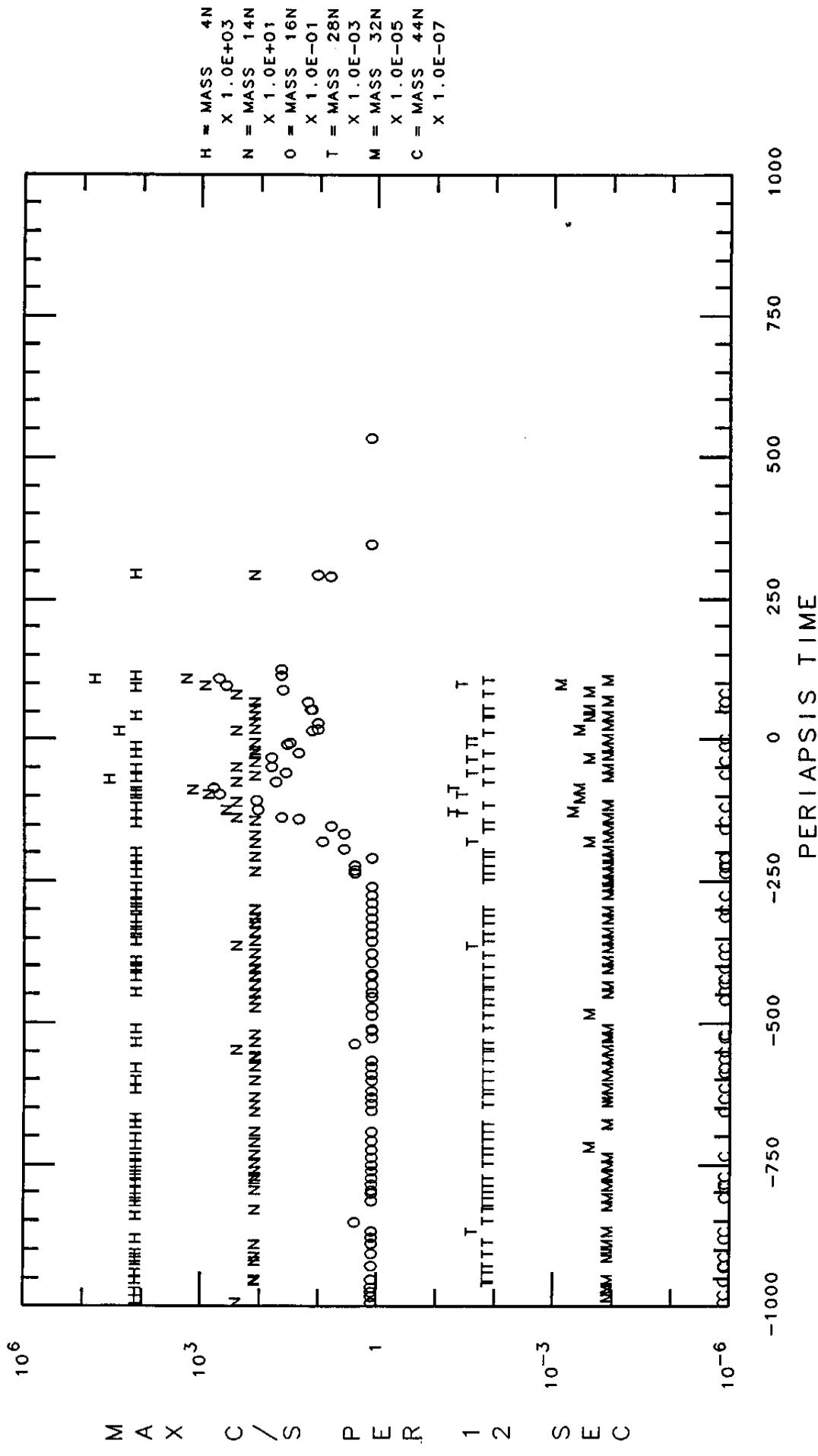
CODE 615

GODDARD SPACE FLIGHT CENTER  
GREENBELT, MD. 20771

Plots 1

# PV-ONMS DATA SUMMARY

SOURCE: EI  
MAX DATA

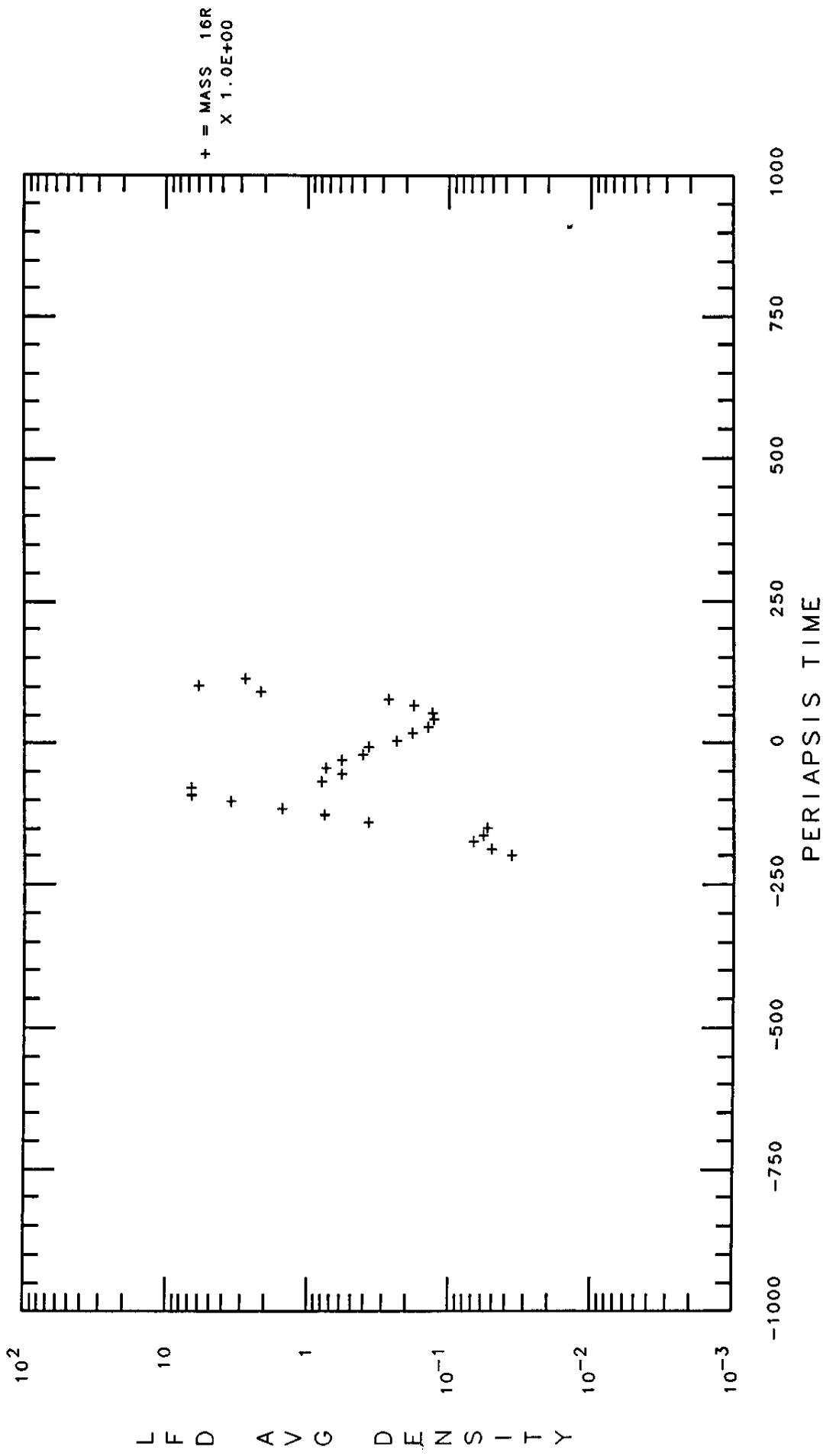


DATA SELECTION: ORBITS FROM 1105. TO 1105.

15:21:29  
05-JUN-87

# PV-ONMS DATA SUMMARY

SOURCE: EI  
LED DATA



DATA SELECTION: ORBITS FROM 1105. TO 1105.

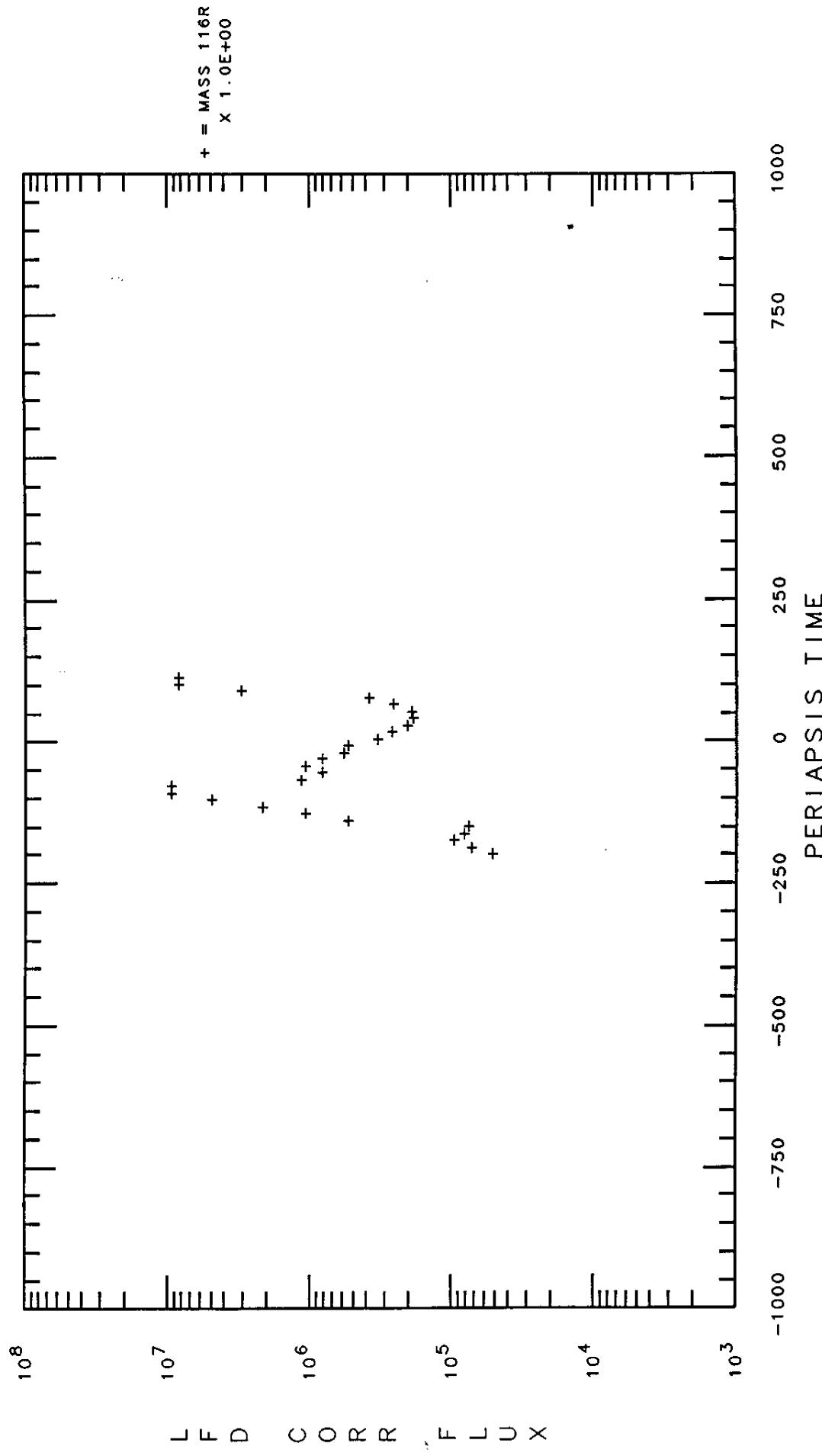
15:21:18  
05-JUN-87

Plots 4

# PV-ONMS DATA SUMMARY

SOURCE: EI

LED DATA



DATA SELECTION: ORBITS

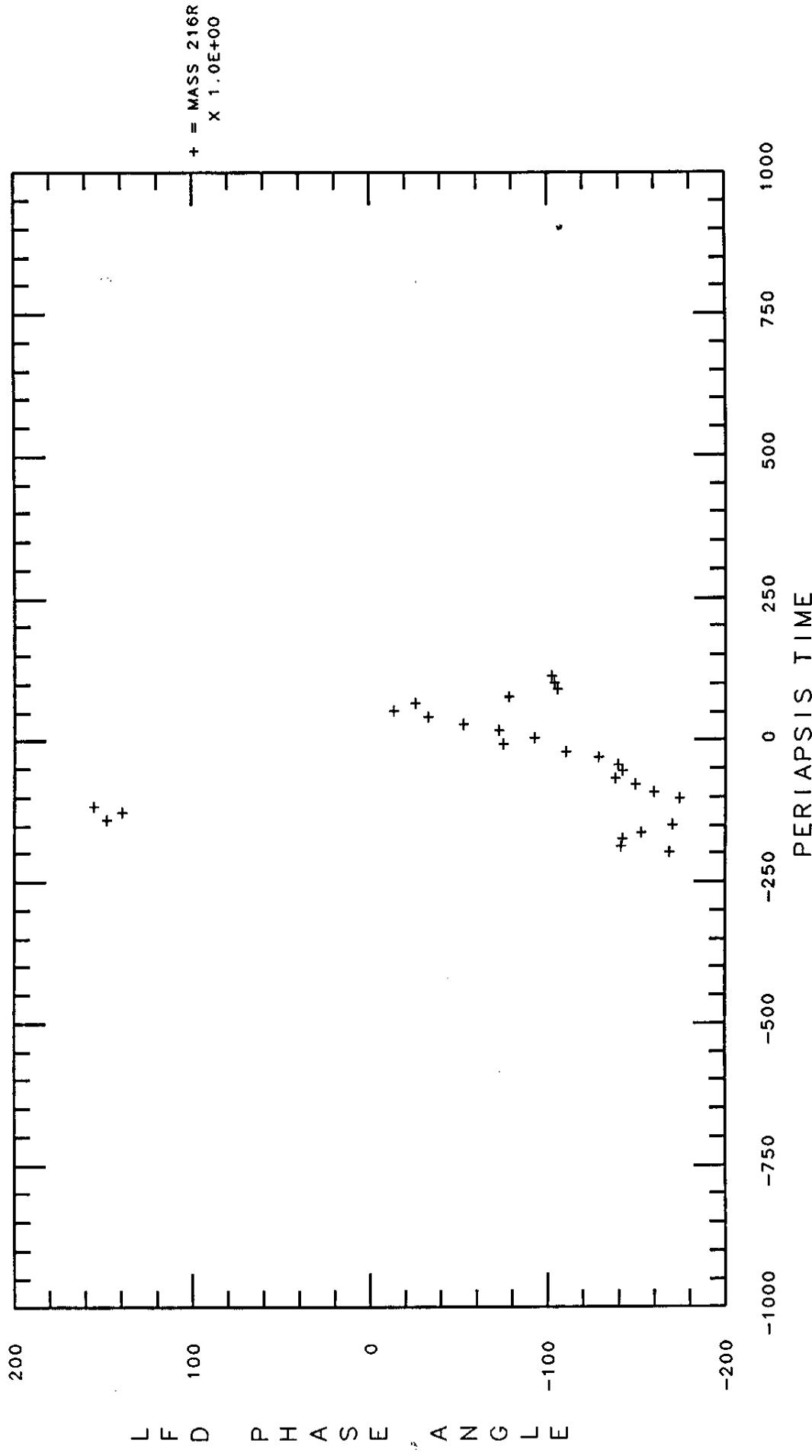
FROM 1105. TO 1105.

15:21:07  
05-JUN-87

Plots 5

PV-ONMS DATA SUMMARY

SOURCE: EI  
LED DATA



DATA SELECTION: ORBITS FROM 1105. TO 1105.

15:20:56  
05-JUN-87





REQ. AGENT	RAND NO.	ACQ. AGENT
-----	-----	-----
RLR		DKB

## PIONEER VENUS-1

HIGH RESOL-ENERGETIC ION (&gt;40EV)

78-051A-11F

This data set consists of 1 tape. The tape is 6250 bpi,  
9-track, multifiled, ascii, and created on the IBM 360. The D  
and C numbers, time spans, and number of files are as follows:

D#	C#	FILES	TIME SPANS
---	--	-----	-----
D-85844	C-28934	08	12/05/78 - 01/03/89

07-MAR-90

TO: 633/P. Butterworth  
National Space Science Data Center

FROM: 615.1/W.T. Kasprzak

SUBJECT: Pioneer Venus Orbiter Neutral Mass Spectrometer  
(ONMS) high resolution energetic ion data

Enclosed is a tape and assorted documentation for the above new data set. The tape contains the high time resolution ("every point") energetic ion data from the ONMS. Also included on the tape are several auxiliary parameters derived from the data. Orbits 1 to 3681 are covered and represent all of the accumulated energetic ion data from the ONMS that is available and processed.

Any questions or problems with the data or the data tapes should be communicated to:

W.T. Kasprzak                  301-286-8253

07-NOV-1989

NSSDC DOCUMENTATION FOR  
PIONEER VENUS ORBITER NEUTRAL MASS SPECTROMETER

## HIGH RESOLUTION ENERGETIC ION DATA

## I. The Orbiter Neutral Mass Spectrometer (ONMS)

The instrument was primarily designed to determine the composition of the neutral exosphere/thermosphere of Venus. However, it has also detected energetic or fast ions whose energy exceeds 40 eV in the spacecraft frame of reference. These ions were observed in early orbits at an altitude higher than that required for measuring the neutral density at periapsis. Once the periapsis altitude had risen above the point where sensible neutral density measurements could be made the instrument was configured specifically to detect energetic ions.

The ONMS instrument has been described in "Pioneer Venus Orbiter Neutral Gas Mass Spectrometer Experiment," IEEE Transactions on Geoscience and Remote Sensing, GE-18 (1), 1980. A summary of the early results for energetic ions has been described in "Observations of Energetic Ions near the Venus Ionopause," Planet. Sp. Sci., 30, 1107-1115, 1982. The method used to reduce the energetic ion data to a flux and density has been described in "Observations of Energetic Ions on the Nightside of Venus," J. Geophys. Res., 92, 291-298, 1987. The data has been used as part of a study of the iontail of Venus in "The Iontail of Venus: Its Configuration and Evidence for Ion Escape," J. Geophys. Res., 92, 15-26, 1987. The global nature of the data has been summarized for the first 2500 orbits in "Fast O<sup>+</sup> Ion Flow Observed Around Venus at Low Altitudes," NASA TM 100717. The angular response and minimum energy have been evaluated in "Pioneer Venus Neutral Mass Spectrometer," a GSFC summer institute project report by Yvette Guenther. The method used to reduce the data assumes cylindrical symmetry of the ion source but in actual fact the source is asymmetrical in its angular response. This can introduce scatter in the data that is a function of the angle of attack. No simple solution has been found for modeling this asymmetry since the actual ion drift vector is unknown. The minimum energy of an ion detectable by the ONMS in energetic ion mode is 35.9 eV, the maximum transmission is assumed to occur about 10 V above this value. On the nightside of Venus the spacecraft potential is negative and the most probable ion energy is near 40 eV. The papers are reproduced here for convenient reference.

## II. Reduction to flux and number density

Reference to the basic data reduction has been given in Section I. Because of the paucity of data at other mass numbers only mass 16 (atomic oxygen) has been reduced to a flux and number density. As part of the reduction process the angle in the ecliptic plane of the apparent ion flow in spacecraft reference frame has been deduced. No correction has been applied to the angle, number density or flux in order to remove the spacecraft velocity. One component of the ion drift can also be deduced perpendicular to the plane containing the axis on the ONMS and the spin axis of the spacecraft. In order to fit the data a minimum of 30 points were required in 36 seconds. In addition the maximum to minimum count ratio was required to be a factor of 3 or greater in order to insure that there was a definitive spin modulation. Only mass 16 (atomic oxygen) is fitted by this process. A constant spacecraft potential of -5 v has been assumed in assigning the effective energy of the ions to 40 eV. The minimum count rate is 1 per integration period or about 6 to 12 counts/s, depending on the bit rate and format of the telemetry data.

In general for orbit numbers 1 to 645 data were taken from RPA mode since the gas background with the filament on was considerably less than in non-RPA mode. For orbit numbers above 923 the instrument was deliberately configured with the filament off and non-RPA mode data was used. For mass 16 the RPA voltage is about +3.8 volts.

## III. The high resolution data.

All orbits have been processed where data exists or can be visually determined to exist. For orbits 1 to 645 a visual examination of the neutral mode data is required in order to identify the regions of energetic ions. For orbits beyond 923 no visual examination was needed. The ONMS instrument was not on for all orbits nor were energetic ions seen on all those orbits in which it was in operation. On the dayside of Venus energetic ions were seen only near the ionopause and when periapsis rose above it energetic ions were no longer observed. The flux values are estimated in the spacecraft reference frame. The density is computed from the flux by dividing it by a speed corresponding to 40 eV.

A time interval of 36 seconds is used in the least squares fit. The center 12 seconds of data is divided by the fitting function to derive the equivalent flux for that point. The center of the new fitting interval is adjusted so that it is centered on the expected signal maximum predicted from the previous interval fit. As a result of this method of fitting discontinuities may exist near minimum angle of attack where one 12 second interval adjoins the next

ONMS-3  
(HR ion)

interval. Several parameters result from the fit: 1) the best estimate of the flux for the interval (used to generate the low resolution UADS data set); 2) the phase shift of signal maximum with respect to that predicted by the position of the velocity vector and its error; 3) the fitting parameter B (Kasprzak et al., 1987); and 4) the effective angle of attack. Other items can be derived from this data: 1) the apparent direction of the ion flow projected into the ecliptic plane; and 2) one component of the ion drift perpendicular to the plane of axis of the ONMS and the spin axis. The phase angle is negative if the predicted signal maximum from the spacecraft velocity is ahead of the true signal maximum when viewed along the -Z spacecraft axis with clockwise rotation. The drift component is derived from the condition that the total relative velocity in the moving reference frame has no component perpendicular to the (ONMS axis, Z axis) plane. Therefore the drift component along this axis is equal to the spacecraft velocity component along this axis.

ONMS-4  
(HR ion)

#### IV. High resolution data tape.

The data tape has the following characteristics:

MEDIUM:	MAGNETIC TAPE
FORMAT:	ASCII
DENSITY:	6250 BPI
TRACKS:	9
PHYSICAL BLOCKSIZE:	9700 BYTES
LOGICAL RECORD SIZE:	97 BYTES
RECORDS/PHYSICAL BLOCK:	100
PHYSICAL RECORD TYPE:	FIXED BLOCK
TAPE LABEL:	UNLABELED
FORMAT:	ASCII
FILES:	ONE FILE PER 500 ORBITS
COMPUTER USED:	VAX 780

The orbits on the tape have been arranged sequentially. The format of the tape is briefly:

RECORD 1:

DESCRIPTION: variable field names

RECORD 2:

DESCRIPTION: FORTRAN format of succeeding data records

RECORD 3:

DESCRIPTION: full data definition for each data field

RECORD 4...:

DESCRIPTION: data, one logical record per point

The field names listed in RECORD 1 are the following:

YYYYDDD    YYYY=4 digit year (e.g. 1978)

              DDD=3 digit day of year (e.g. 053)

UT(ms)      Universal time in ms

ORBIT        Orbit number

MS            Mass number -

              16 for 0

F            Flag -

              D single data point flux, density

              A fitted parameters for interval

DENSITY     Effective number density assuming a 40 eV ion (particles/cm<sup>3</sup>)

FLUX        Flux (particles/cm<sup>2</sup>/s) AZ. ANG Azimuth angle of apparent ion flow direction projected into the ecliptic plane (deg)

PHASE       Phase shift of signal maximum with respect to that predicted by velocity vector (deg)

ERROR       Error in phase shift (deg)

ANGATK     Effective angle of attack (deg)

WP DIR      Direction of drift component perpendicular to (ONMS axis, Z axis) projected into the ecliptic plane (deg)

WP XY       Magnitude of drift component (m/s)

ONMS-5  
(HR ion)

B Fitting parameter

No spacecraft positional parameters have been included in the data set. These can be obtained from the SEDR data tape submitted separately by the Project.

Orbit parameters can be calculated with the orbit programs and data files include in the data set 78-051A-001

[26-FEB-90]

Several orbits of energetic ion data show individual points that that are erroneous and probably wrong.

ORBIT	LOW RESOLUTION DATA PERIAPSIS TIME TAG	UNIVERSAL TIME OF TIME TAG (ms)
3453	-180	8722030
	-168	8734030
3660	-576	10603177
	-564	10615177
	-468	10711177
	-456	10723177
	-336	10843177
3681	-648	10915226
	-636	10927226

High resolution data in the same time frame, plus or minus 12 seconds, is most likely wrong.

2 March 1990

To: Wayne Kasprzak  
From: Joel Selekof *JSS*  
Re: HTP data tape for NSSDC

A tape has been created for NSSDC (and a duplicate for us) containing HTP high resolution energetic ion data for orbits 1-3681. The tape is 6250bpi, ascii records, each record has length of 97 bytes, blocked at 100 records per block (9700 bytes per block).

The tape consists of 8 files:

file	orbit
---	-----
1	1 - 500
2	501 - 1000
3	1001 - 1500
4	1501 - 2000
5	2001 - 2500
6	2501 - 3000
7	3001 - 3500
8	3501 - 3681

Attached is a listing of the first 3 blocks of file 1. Also attached is a sample program for reading the data.

YYYYDDD	UT(MS)	ORBIT	MS	F	DENSITY	FLUX	AZ.	ANG	PHASE	ERROR	ANGATK	WP	DIR	WP	XY	B
(I7,I9,I5,I3,1X,A1,1P2E8.2,0P5F7.1,1P2E8.2)																
	0	0	0	1.00E+38	1.00E+38	999.0	999.0	999.0	999.0	999.0	999.0	1.00E+38	1.00E+38			
1978339	54427498	1	18	D	1.90E+00	4.17E+06	999.0	999.0	999.0	-30.5	999.0	1.00E+38	1.00E+38			
1978339	54430152	1	18	D	2.55E+00	5.80E+06	999.0	999.0	999.0	10.8	999.0	1.00E+38	1.00E+38			
1978339	54432808	1	18	D	4.78E-01	1.05E+06	999.0	999.0	999.0	44.6	999.0	1.00E+38	1.00E+38			
1978339	54435464	1	18	D	2.95E+00	6.49E+06	999.0	999.0	999.0	-58.9	999.0	1.00E+38	1.00E+38			
1978339	54432508	1	18	A	1.93E+00	4.23E+06	130.2	3.8	6.5	999.0	-3.8	3.38E+02	3.81E+00			
1978339	54438164	1	18	D	3.41E-01	7.49E+05	999.0	999.0	999.0	-45.0	999.0	1.00E+38	1.00E+38			
1978339	54440820	1	18	D	8.09E-01	1.78E+06	999.0	999.0	999.0	-11.2	999.0	1.00E+38	1.00E+38			
1978339	54443478	1	18	D	3.54E-01	7.78E+05	999.0	999.0	999.0	28.4	999.0	1.00E+38	1.00E+38			
1978339	54448132	1	18	D	2.09E+00	4.59E+06	999.0	999.0	999.0	55.3	999.0	1.00E+38	1.00E+38			
1978339	54441580	1	18	A	7.68E-01	1.68E+06	123.0	3.9	8.0	999.0	-4.0	3.40E+02	3.87E+00			
1978339	54448832	1	18	D	3.88E-01	8.08E+05	999.0	999.0	999.0	-62.5	999.0	1.00E+38	1.00E+38			
1978339	54451488	1	18	D	4.48E-01	9.83E+05	999.0	999.0	999.0	-23.4	999.0	1.00E+38	1.00E+38			
1978339	54454144	1	18	D	4.79E-01	1.05E+06	999.0	999.0	999.0	16.9	999.0	1.00E+38	1.00E+38			
1978339	54458800	1	18	D	2.41E-01	5.30E+05	999.0	999.0	999.0	48.6	999.0	1.00E+38	1.00E+38			
1978339	54453488	1	18	A	5.05E-01	1.11E+06	125.1	3.8	7.3	999.0	-4.6	3.31E+02	3.81E+00			
1978339	54458498	1	18	D	8.85E-01	2.16E+06	999.0	999.0	999.0	-58.9	999.0	1.00E+38	1.00E+38			
1978339	54482152	1	18	D	1.18E-01	2.56E+05	999.0	999.0	999.0	-35.2	999.0	1.00E+38	1.00E+38			
1978339	54484808	1	18	D	7.88E-01	1.73E+06	999.0	999.0	999.0	5.1	999.0	1.00E+38	1.00E+38			
1978339	54487484	1	18	D	4.04E-01	8.88E+05	999.0	999.0	999.0	38.9	999.0	1.00E+38	1.00E+38			
1978339	54470184	1	18	D	1.03E+00	2.27E+06	999.0	999.0	999.0	57.4	999.0	1.00E+38	1.00E+38			
1978339	544885048	1	18	A	8.57E-01	1.44E+08	126.7	3.8	7.8	999.0	-5.4	3.07E+02	3.57E+00			
1978339	54472820	1	18	D	2.48E-01	5.40E+05	999.0	999.0	999.0	-46.1	999.0	1.00E+38	1.00E+38			
1978339	54475478	1	18	D	6.58E-01	1.45E+06	999.0	999.0	999.0	-13.4	999.0	1.00E+38	1.00E+38			
1978339	54478132	1	18	D	2.58E-01	5.83E+05	999.0	999.0	999.0	25.9	999.0	1.00E+38	1.00E+38			
1978339	54480832	1	18	D	1.18E+00	2.81E+06	999.0	999.0	999.0	53.2	999.0	1.00E+38	1.00E+38			
1978339	54476644	1	18	A	5.19E-01	1.14E+06	125.3	3.1	11.1	999.0	-6.5	2.63E+02	3.10E+00			
1978339	54483488	1	18	D	1.32E-01	2.89E+05	999.0	999.0	999.0	-54.6	999.0	1.00E+38	1.00E+38			
1978339	54488144	1	18	D	5.14E-02	1.13E+05	999.0	999.0	999.0	-29.9	999.0	1.00E+38	1.00E+38			
1978339	54488800	1	18	D	1.20E-01	2.83E+05	999.0	999.0	999.0	8.8	999.0	1.00E+38	1.00E+38			
1978339	54491498	1	18	D	5.62E-02	1.23E+05	999.0	999.0	999.0	42.8	999.0	1.00E+38	1.00E+38			
1978339	54494152	1	18	D	1.55E-01	3.40E+05	999.0	999.0	999.0	-58.7	999.0	1.00E+38	1.00E+38			
1978339	54488348	1	18	A	1.10E-01	2.41E+05	117.9	2.2	18.2	999.0	-7.9	1.81E+02	2.15E+00			
1978339	54531484	1	18	D	3.78E-02	8.28E+04	999.0	999.0	999.0	-34.3	999.0	1.00E+38	1.00E+38			
1978339	54534164	1	18	D	3.35E-02	7.36E+04	999.0	999.0	999.0	2.9	999.0	1.00E+38	1.00E+38			
1978339	54536820	1	18	D	4.07E-02	8.94E+04	999.0	999.0	999.0	37.0	999.0	1.00E+38	1.00E+38			
1978339	54535998	1	18	A	3.55E-02	7.79E+04	141.8	0.7	10.6	999.0	-11.5	5.68E+01	7.08E-01			
1978339	54542132	1	18	D	3.30E-02	7.24E+04	999.0	999.0	999.0	-43.1	999.0	1.00E+38	1.00E+38			
1978339	545444832	1	18	D	3.57E-02	7.84E+04	999.0	999.0	999.0	-10.3	999.0	1.00E+38	1.00E+38			
1978339	54547488	1	18	D	5.14E-02	1.13E+05	999.0	999.0	999.0	28.5	999.0	1.00E+38	1.00E+38			
1978339	54550144	1	18	D	4.94E-02	1.09E+05	999.0	999.0	999.0	51.4	999.0	1.00E+38	1.00E+38			
1978339	54546028	1	18	A	4.49E-02	9.88E+04	144.9	1.2	7.0	999.0	-11.8	9.19E+01	1.16E+00			
1978339	54830138	1	18	D	4.30E-02	9.44E+04	999.0	999.0	999.0	42.2	999.0	1.00E+38	1.00E+38			
1978339	54832838	1	18	D	9.05E-02	1.99E+05	999.0	999.0	999.0	-43.9	999.0	1.00E+38	1.00E+38			
1978339	54834128	1	18	A	5.88E-02	1.25E+05	128.5	0.5	73.1	999.0	-34.8	2.93E+01	5.21E-01			
1978339	54838148	1	18	D	1.68E-02	3.85E+04	999.0	999.0	999.0	22.2	999.0	1.00E+38	1.00E+38			
1978339	54840804	1	18	D	4.47E-02	9.83E+04	999.0	999.0	999.0	42.8	999.0	1.00E+38	1.00E+38			
1978339	54843500	1	18	D	9.01E-02	1.98E+05	999.0	999.0	999.0	-43.0	999.0	1.00E+38	1.00E+38			
1978339	54843128	1	18	A	8.80E-02	1.45E+05	161.0	1.7	20.9	999.0	-34.8	9.58E+01	1.72E+00			
1978339	54846158	1	18	D	4.12E-02	9.05E+04	999.0	999.0	999.0	-31.5	999.0	1.00E+38	1.00E+38			
1978339	54848812	1	18	D	8.94E-02	1.52E+05	999.0	999.0	999.0	-7.7	999.0	1.00E+38	1.00E+38			
1978339	54851488	1	18	D	1.85E-02	4.07E+04	999.0	999.0	999.0	28.8	999.0	1.00E+38	1.00E+38			
1978339	54854188	1	18	D	3.88E-02	8.07E+04	999.0	999.0	999.0	45.0	999.0	1.00E+38	1.00E+38			

```
C READS 3 BLOCKS OF DATA FROM NSSDC TAPE.  
C J SELEKOF 3/90  
C  
LOGICAL*1 BLOCK(9700),REC(97)  
DATA NBLK /0/  
TYPE *, 'ENTER TAPE DRIVE NUMBER'  
ACCEPT *, LDRV  
CALL T_RWND(LDRV)  
CALL T_WAIT(LDRV,NS,NB)  
TYPE *, 'HOW MANY FILES TO SKIP?'  
ACCEPT *, NSKIP  
IF(NSKIP.EQ.0) GO TO 10  
CALL T_SKPF(LDRV,NSKIP)  
C  
C READ IN A BLOCK OF DATA (100 RECS) OFF THE TAPE AND SEPARATE  
C INTO RECORDS.  
C  
10 NBLK=NBLK+1  
IF(NBLK.GT.3) GO TO 900  
WRITE(5,500) NBLK  
500 FORMAT(' READING BLOCK',I4)  
CALL T_READ(LDRV,BLOCK,9700)  
CALL T_WAIT(LDRV,NS,NB)  
IF(NS.EQ.1) GO TO 900  
N=0  
DO 100 I=1,100  
DO 110 J=1,97  
N=N+1  
REC(J)=BLOCK(N)  
110 CONTINUE  
WRITE(4,50) REC  
50 FORMAT(1X,97A1)  
100 CONTINUE  
C  
C GO TO NEXT BLOCK  
C  
GO TO 10  
C  
900 CALL T_RWND(LDRV)  
CALL T_WAIT(LDRV,NS,NB)  
STOP  
END
```





REQ. AGENT

RAND NO.

ACQ. AGENT

-----  
RLR

-----  
DKB

PIONEER VENUS-1

LOW & HIGH RESOL. NEUT. DENSITIES

78-051A-11G

This data set consists of 1 tape. The tape is 1600 bpi,  
9-track, multifiled, ascii, and created on the IBM 360. The D  
and C numbers, time spans, and number of files are as follows:

D#	C#	FILES	TIME SPANS
--	--	-----	-----
D-85845	C-28935	02	12/07/78 - 09/05/80

Pioneer Venus Orbiter Neutral Mass Spectrometer  
High Resolution Neutral Density Data Set  
(13-DEC-1988)

1. The Orbiter Neutral Mass Spectrometer (ONMS)

The instrument was designed to determine the composition of the neutral thermosphere/exosphere of Venus. The term composition includes both the type of neutral gases present and their quantitative amount. The measurements begin at the orbit's periapsis altitude and extend to a limiting altitude at which the ambient signal becomes comparable to the gas background and/or detector measurement threshold. The neutral composition includes helium, atomic nitrogen, atomic oxygen, molecular nitrogen, carbon monoxide and carbon dioxide.

The Pioneer Venus Project, its aims and early scientific results have been described in a special issue of Journal of Geophysical Research (1980). The instruments and spacecraft have been described in a special issue of the IEEE Transactions on Geoscience and Remote Sensing (1980). A more complete survey of results are contained in the book VENUS (Hunten et al., 1983). The reference section contains a list of relevant ONMS publications and some of these have been reproduced here for convenience. The instrument has been described in Niemann et al. (1980a) and the basic data reduction in Niemann et al. (1980b).

The spacecraft orbit is nearly polar (105.6 degrees inclination) with periapsis near the equator (17 degrees north celestial latitude) and has an average period of 24.03 hours. The local time of periapsis increases 1.6 degrees/day (or orbit) so that it takes 224.7 days to sample one complete diurnal cycle (dayside, evening terminator, nightside, and morning terminator). For the first 600 orbits the altitude of periapsis varied from 142 km to 250 km. After this period the periapsis altitude was no longer controlled and rose in response to the solar gravitational perturbations. The spacecraft spins with a nominal period of 12 seconds about an axis which points toward the south ecliptic pole. The ONMS instrument is mounted at an angle of 26.5 degrees with respect to the spin axis.

## 2. Data

The source of the data and their corrections are summarized below:

<u>SPECIES</u>	<u>M/E USED</u>	<u>COMMENTS</u>
He	4	
N	30	Surface recombined N and O
O	32	Surface recombined O to O <sub>2</sub> ; corrected for CO <sub>2</sub> fragmentation corrected for estimated surface recombination of O to CO <sub>2</sub> *
N <sub>2</sub> ,CO	14,28	m/e 14 corrected for NO, CO and CO <sub>2</sub> fragmentation; m/e 28 corrected for CO <sub>2</sub> fragmentation
CO <sub>2</sub>	44	Corrected for surface recombination of O to CO <sub>2</sub> *

\* the correction is based on matching scale height  
temperatures of O and CO<sub>2</sub>.

The data are from the nonretarding potential mode of the instrument. Data from the retarding mode are consistent with those obtained from the nonretarding mode and have not been included. The data set does not include the factor of 1.6 increase in density needed to maintain compatibility with other data sets as discussed by Hedin et al. (1983). Two data sets are provided: high resolution (HIRES), every point, composition; and low resolution (LORES), 12 second sampled, composition. The LORES data set represents the best estimated composition data and is derived from the HIRES data set. The orbit range covered is 1 to 640 for both data sets.

Several criteria were invoked when inserting data for a given orbit: orbit and attitude parameters must exist (project supplied); the spacecraft format and bit rate must be appropriate for acquisition of data by the ONMS; and the command sequence for the instrument must be appropriate for useful determination of atmospheric composition. Cases where useful composition cannot be determined include special test modes (e.g. retarding potential sweeps, filament off) and 1/8 unit amu sweep modes. In addition composition for the LORES data set cannot be easily determined for unit amu sweep mode. The ONMS was not operational for every orbit nor is every orbit complete due to data gaps introduced by use of telemetry formats for which the ONMS has no instrument output.

Useful composition data are gathered from the lowest periapsis altitude to a maximum altitude generally around 250

km (about 300 km for He). The actual maximum altitude depends on the accumulated surface gas buildup acquired from previous orbits which creates a gas background. The gas background was estimated from high altitude averages of the data and for all species, except helium, an inbound signal/background ratio of 2 and an outbound signal/background ratio of 4 were used as cutoff values. In some cases energetic ions (e.g. Kasprzak et al., 1992) were observed at low altitudes (e.g. below 300 km for orbit 219) and these were removed when visually detected. Some problems have been observed in the high altitude data very near cutoff, particularly for outbound N2. Several data points were never removed and appear higher than the expected extrapolation of the data to that time.

Residual spin modulation which had not been completely removed is evident in the processed data. The source of the spin residuals are the gas/surface adsorption/desorption effects which were not removed from the data and a noncosine behavior for the response of the ion source density with angle of attack. Another feature observed occasionally at large angles of attack (>40 degrees) is a reduction of the data when compared to data at lower angles of attack. This has been determined to be due to antenna shadowing; that is, the ONMS geometric view cone "sees" the spacecraft antenna at extreme angles of attack. Occasionally near minimum angle of attack (<10 degrees) enhanced data points are observed for m/e=4 (He channel) which are apparently high energy ions/neutrals travelling along the tube axis and being detected. The more extreme points in either of these two cases have been mass flagged.

The data time spacing depends on the spacecraft bit rate and format, and the particular instrument commands executed. Usually programmed mass format was used but occasionally unit amu and 1/8 amu sweeps were implemented. Several orbits switched from low electron energy to high electron energy and as a result there may be a discontinuity at the transition point. The 1/8 amu sweep data have not been included.

Atomic nitrogen was measured routinely only after orbit 190.

Orbits 1-19 generally do not have reliable relative composition due to the fact that gas-surface processes in the ion source had not stabilized. This affects all surface reactive species except He.

Isolated (one or two points per several spin cycles) high resolution data points are occasionally observed and they should be regarded as erroneous points which are more likely wrong than right.

The error associated with the points is more an

indication of data quality than of absolute uncertainty. It contains the statistical error of the data determined for the principle m/e used for the species from the detector signal plus the errors coming from any other species used to correct the data. It also contains a contribution which is proportional to the background/signal ratio. The total relative error is at least an additional 5-10% above this value.

The LORES data set is a companion data set created from the HIRES data and is generally more restricted since it requires all data to be available for the needed corrections in order to output a particular data point.

No spacecraft positional parameters have been included in the data sets. These can be obtained from the SEDR data submitted separately by the Project.

As of this date no known malfunction of the ONMS has been encountered.

④ Spacecraft orbit parameters can be also obtained with the orbit programs and data files included in data set  
78-051A-00J

### 3. Hires Data tape

The data tape has the following characteristics:

TYPE:	9-TRACK
DENSITY:	1600 bpi
PHYSICAL BLOCK SIZE:	4800 bytes
LOGICAL RECORD SIZE:	60 bytes
LOGICAL RECORDS/PHYSICAL BLOCK:	80
FORMAT:	ASCII
LABEL:	NONE
FILES:	1

The first 3 records describe how to read and interpret the remaining portion of the tape. The following descriptions assume a FORTRAN code for reading the tape. The tape contains orbits in increasing orbit number order with data for each orbit in increasing time order.

#### 3.1 Record 1

This record contains the variable field names. It is read as:

```
CHARACTER*60 DESC
READ(UNIT,'(A)') DESC
```

The fields are:

YYYYDDD	YYYY=4 digit year (e.g. 1979) DDD=3 digit day of year (e.g. 053)
UT(ms)	Universal time in ms
ORBIT	Orbit number
MS	Mass number - 4 for He            28 for N2 14 for N           29 for CO 16 for O           44 for CO2
F	Flag - F for fully corrected P for preliminary (not fully corrected) M for mass flagged (problem point; probably wrong) N for final density negative (only preliminary density given)
ODENS	Preliminary density (part/cc)
FDENS	Final corrected density (part/cc)
ANGATK	Angle of attack (degrees)
PCERR	% error in density -1 if error >127%

Notes:

- 1) For CO2 both ODENS and FDENS are given since the final correction to this species depends on a model:  
 New CO2 density = Old CO2 density - 0.019 x Old O density  
 New O density = Old O density + 0.019 x Old O density  
 Only the New O density is given.
- 2) Mass flagged points are usually points that fall excessively beyond range of the main body of the data. They may be wild points, points with wrong mass designations or simply wrong for other reasons.
- 3) The best estimate of the density is to be found in the F data.
- 4) Data with errors greater than about 30% should be considered unreliable.
- 5) The angle of attack is included to help sort out low points due to antenna shadowing (all species) which occurs beyond 40 degrees and high ram points seen in He within 10 degrees angle of attack. Some of these points have already been mass flagged. In general, it would be best to not include data in these regions.

### 3.2 Record 2

This record contains FORTRAN format for the remaining records. It is read as follows:

```
CHARACTER*60 FMT
READ(UNIT,'(A)') FMT
```

### 3.3 Record 3

This record contains the fill values for the fields described in records 1 and 2. It is read as follows:

```
INTEGER*4 F1,F2,F3,F4
CHARACTER*1 F5
REAL F6,F7,F8,F9
READ(UNIT,FMT) F1,F2,F3,F4,F5,F6,F7,F8,F9
```

### 3.4 Record 4...

The main data records with one record per point. They are read as follows:

```
INTEGER*4 YYYYDDD,UT,ORBIT,MASS
CHARACTER*1 F
REAL ODENS,FDENS,ANGATK,PCERR
READ(UNIT,FMT,END=?) YYYYDDD,UT,ORBIT,MASS,F,
ODENS,FDENS,ANGATK,PCERR
```

#### 4. LORES data

This data is a low time resolution, representative sample, of the high resolution data. It is constructed at designated times which have been supplied by the Project. Data with errors greater than 30% are not included nor are data with angles of attack greater than 40 degrees. An absolute altitude cutoff of 250 km was used for all species except for He for which 350 km was used.

Each representative data point is constructed using an exponentially weighted average of the data over a 24 second interval centered at the sample point time. Corrections to the number densities of CO<sub>2</sub> and O for surface reactions were made at this time based on empirical model results. A minimum of 3 data points per species and all data available for corrections are required to be present in order for a sample point to be output. The total number density and total mass density are computed if all major species (CO<sub>2</sub>, CO, N<sub>2</sub>, and O) are present. The data spacing is nominally 12 seconds except for the -12, 0, 12 time tags. Although time tags from -1800 to 1800 seconds are generated only those data records are output for which at least one species has a valid value for that time tag.

The variable names used for the species:

<u>ITEM</u>	<u>NAME</u>	<u>DESCRIPTION</u>	<u>UNITS</u>
1	DHE	Number density of He	part/cc
2	DN	Number density of N	part/cc
3	DO	Number density of O	part/cc
4	DN2	Number density of N <sub>2</sub>	part/cc
5	DCO	Number density of CO	part/cc
6	DCO2	Number density of CO <sub>2</sub>	part/cc
7	DRHO	Total mass density	g/cc
8	DTOT	Total number density	part/cc

Additional fields included:

<u>NAME</u>	<u>DESCRIPTION</u>
YYYYDDD	YYYY=4 digit year DDD=3 digit day of year
UT	Universal time (ms)
ORBIT	Orbit number
TIMTAG	Nominal time tag assigned by project

The data tape has the following characteristics:

TYPE:	9-TRACK
DENSITY:	1600 bpi
PHYSICAL BLOCK SIZE:	1000 bytes
LOGICAL RECORD SIZE:	100 bytes
LOGICAL RECORDS/PHYSICAL BLOCK:	10
FORMAT:	ASCII

LABEL: NONE  
 FILES: 1

The structure of the tape corresponds to the UADS structure defined by the Project and described in an accompanying document. The first 3 records describe how to read and interpret the remaining portion of the tape. The following descriptions assume FORTRAN code for reading the tape.

The tape contains the orbits in increasing orbit number order with data in increasing time order within each orbit.

#### 4.1 Record 1

This record contains the variable field names for each record excluding the first 4 fields which are the YYYYDDD, UT(ms), orbit number and nominal time tag. It is read as:

```
PARAMETER (NVAR=8)
CHARACTER*4 NAMES(NVAR)
READ(UNIT,'(I3,<NVAR>(1X,A4))') NV,(NAMES(I),I=1,NV)
```

The 8 field names correspond to the 8 items previously mentioned.

#### 4.2 Record 2

This record contains the FORTRAN format for the remaining records and includes the 4 leading fields and the 8 remaining fields. It is read as:

```
PARAMETER (NBYT=100)
BYTE FORMAT(NBYT)
READ(UNIT,'(<NBYT>A1)') FORMAT
```

#### 4.3 Record 3

This record contains the fill values for the fields described. It is read as:

```
PARAMETER (NV=8,NVAR=4+NV)
INTEGER*4 F1,F2
INTEGER*2 F3,F4
REAL*4 F5,F6,F7,F8,F9,F10,F11,F12
READ(UNIT,FORMAT,END=?) F1,F2,F3,F4,F5,F6,F7,F8,F9,
F10,F11,F12
```

#### 4.4 Record 4...

The main data records with one record per sample time point, maximum of 8 species per line:

```
PARAMETER (NV=8,NVAR=4+NV)
```

11G-9

```
INTEGER*4 YYYYDDD,UT
INTEGER*2 ORBIT,TIMTAG
REAL*4 DATA(NV)
READ(UNIT,FORMAT) YYYYDDD,UT,ORBIT,TIMTAG,
  (DATA(I),I=1,NV)
```

## 5. Auxiliary documents

The following documents have been included for further reference:

- a) Reproductions of relevant publications
- b) Summary list of orbits not included and list of possible anomalies for orbits included
- c) Plots illustrating possible problems in the data
- d) Proposed NSSDC low frequency data format from the Project
- e) Dump of first few records of each data tape

Any problems/questions should be directed to:

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(301)-286-8705

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COMMENTS ON ORBITS NOT ON THE NSSDC ONMS NEUTRAL ATMOSPHERE TAPE AND  
OTHER SPECIAL NOTES

The following is a list of orbits not contained in the data tape. Generally speaking the term 'NO DATA AVAILABLE FOR THIS ORBIT' means no telemetry tape was received or that, for this orbit, the telemetry format did not contain ONMS words. The term 'NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS' generally indicates that the telemetry format near periapsis did not contain ONMS words or that there was a loss of telemetry data; data were received at higher altitudes but well beyond the range of the sensible neutral atmosphere. 1/8 amu sweep mode has a very low data rate and it is very difficult to fully correct the composition so that where that mode is used there is no data. Engineering tests do not yield any useful atmospheric densities.

ORBIT COMMENT

- \*\* 1 PERIAPSIS ALTITUDE TOO HIGH FOR ATMOSPHERE DETECTION
- 2 RPA SWEEP MODE TEST-NO DATA AVAILABLE
- 2-19 GAS SURFACE REACTIONS FOR O AND CO<sub>2</sub> NOT STABILIZED
- 8 RPA SWEEP MODE TEST-NO DATA AVAILABLE
- 10 UNIT SWEEP
- 15 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 23 UNIT SWEEP
- 24 RPA SWEEP MODE TEST-NO DATA AVAILABLE
- 31 1/8 SWEEP-NO DATA AVAILABLE
- 32 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 34 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 40 1/8 UNIT SWEEP-NO DATA AVAILABLE
- 47 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 48 RPA MODE SWEEP MODE TEST
- 55 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 56 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 58 UNIT SWEEP
- 63 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC
- 64 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 65 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 69 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 71 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 72 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 78 LOW ELECTON ENERGY
- 80 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 81 UNIT SWEEP
- 83 UNIT SWEEP
- 86 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC
- 88 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 89 NO DATA FOR THIS ORBIT
- 91 UNIT SWEEP
- 93 UNIT SWEEP
- 94 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC
- 96 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS
- 99 UNIT SWEEP
- 100 UNIT SWEEP
- 102 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC
- 104 UNIT SWEEP

107 UNIT SWEEP  
110 UNIT SWEEP  
112 UNIT SWEEP  
113 UNIT SWEEP  
118 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC  
120 UNIT SWEEP  
123 UNIT SWEEP  
125 RPA MODE SWEEP MODE TEST  
126 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC  
128 UNIT SWEEP  
131 UNIT SWEEP  
136 UNIT SWEEP  
139 UNIT SWEEP  
142 MASS 44 ONLY  
144 UNIT SWEEP  
147 UNIT SWEEP  
150 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC  
152 UNIT SWEEP  
155 UNIT SWEEP  
156 ENGINEERING TEST  
158 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC  
160 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC  
163 MASS 44 ONLY  
166 LOW ELECTRON ENERGY PERIAPSIS TIME < 60 SEC  
168 UNIT SWEEP  
171 UNIT SWEEP  
174 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
176 ENGINEERING TEST-NO DATA AVAILABLE  
182 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
190 UNIT SWEEP  
192 MASS 44 ONLY  
193 ENGINEERING TEST-NO DATA AVAILABLE  
196 NO DATA AVAILABLE NEAR PERIAPSIS  
198 UNIT SWEEP  
200 MASS 44 ONLY  
201 UNIT SWEEP  
206 UNIT SWEEP  
217 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
225 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
233 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
241 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
243 1/8 UNIT SWEEP-NO DATA AVAILABLE  
248 UNIT SWEEP  
249 NO DATA AVAILABLE FOR THIS ORBIT  
250 NO DATA AVAILABLE FOR THIS ORBIT  
251 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
\*\*252-281 ORBITER TURNED OFF DURING PIONEER-SATURN ENCOUNTER  
282 NO DATA FOR THIS ORBIT  
284 NO DATA FOR THIS ORBIT  
286 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
290 ATTITUDE DATA NECESSARY FOR PROCESSING NOT AVAILABLE  
293 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
294 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
296 UNIT SWEEP

297 UNIT SWEEP  
303 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
310 UNIT SWEEP  
317 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
321 NO DATA FOR THIS ORBIT  
326 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
327 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
330 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
331 UNIT SWEEP  
336 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
338 UNIT SWEEP  
339 COMMANDS NOT PROPERLY LOADED-NO DATA AVAILABLE  
342 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
345 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
346 LOW DATA RATE (PERC @256 BPS)  
353 UNIT SWEEP  
358 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
359 NO DATA FOR THIS ORBIT  
360 UNIT SWEEP  
362 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
364 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
367 UNIT SWEEP  
374 UNIT SWEEP  
378 NO DATA AVAILABLE FOR ONMS NEAR PERIPASIS  
381 UNIT SWEEP  
388 UNIT SWEEP  
395 UNIT SWEEP  
397 QUESTIONABLE TEPOCH FOR DATA SAMPLE-NO LORES DATA  
398 NO DATA FOR THIS ORBIT  
402 UNIT SWEEP  
406 NO DATA FOR THIS ORBIT  
409 UNIT SWEEP  
416 UNIT SWEEP  
418 COMMANDS NOT PROPERLY LOADED-NO DATA AVAILABLE  
423 UNIT SWEEP  
430 UNIT SWEEP  
432 RPA SWEEP MODE TEST  
434 LOW ELECTRON ENERGY  
436 NO DATA FOR THIS ORBIT  
437 UNIT SWEEP  
438 ENGINEERING TEST-NO DATA AVAILABLE  
443 COMMANDS NOT PROPERLY LOADED-NO DATA AVAILABLE  
444 UNIT SWEEP  
451 UNIT SWEEP  
455 COMMANDS NOT PROPERLY LOADED-NO DATA AVAILABLE  
458 UNIT SWEEP  
465 UNIT SWEEP  
467 RPA MODE SWEEP TEST  
469 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
470 1/8 UNIT SWEEP-NO DATA AVAILABLE  
471 LOW ELECTRON ENERGY  
472 UNIT SWEEP  
479 UNIT SWEEP  
484 ENGINEERING TEST-NO DATA AVAILABLE

C4

486 UNIT SWEEP  
492 UNIT SWEEP  
499 UNIT SWEEP  
501 RPA MODE SWEEP TEST  
503 1/8 UNIT SWEEP-NO DATA AVAILABLE  
505 LOW ELECTRON ENERGY  
506 UNIT SWEEP  
510 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
513 UNIT SWEEP  
518 NO DATA FOR THIS ORBIT  
520 UNIT SWEEP  
527 UNIT SWEEP  
534 UNIT SWEEP  
536 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
538 1/8 UNIT SWEEP-NO DATA AVAILABLE  
540 LOW ELECTRON ENERGY  
541 UNIT SWEEP  
542 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
548 UNIT SWEEP  
553 ENGINEERING TEST-NO DATA AVAILABLE  
555 UNIT SWEEP  
562 UNIT SWEEP  
565 1/8 UNIT SWEEP-NO DATA AVAILABLE  
569 UNIT SWEEP

\*\*\*\*\*  
NOTE: ORBITS 570-583 HAVE SPIN RATE 15 RPM, ORBITS 584-586 HAVE SPIN RATE 10 RPM; NORMAL SPIN RATE IS 5 RPM  
\*\*\*\*\*

570 NO DATA AVAILABLE FOR ONMS NEAR PERIAPSIS  
575 LOW ELECTRON ENERGY  
576 UNIT SWEEP  
583 UNIT SWEEP  
588 ENGINEERING TEST-NO DATA AVAILABLE  
590 UNIT SWEEP  
597 UNIT SWEEP  
600 1/8 UNIT SWEEP-NO DATA AVAILABLE

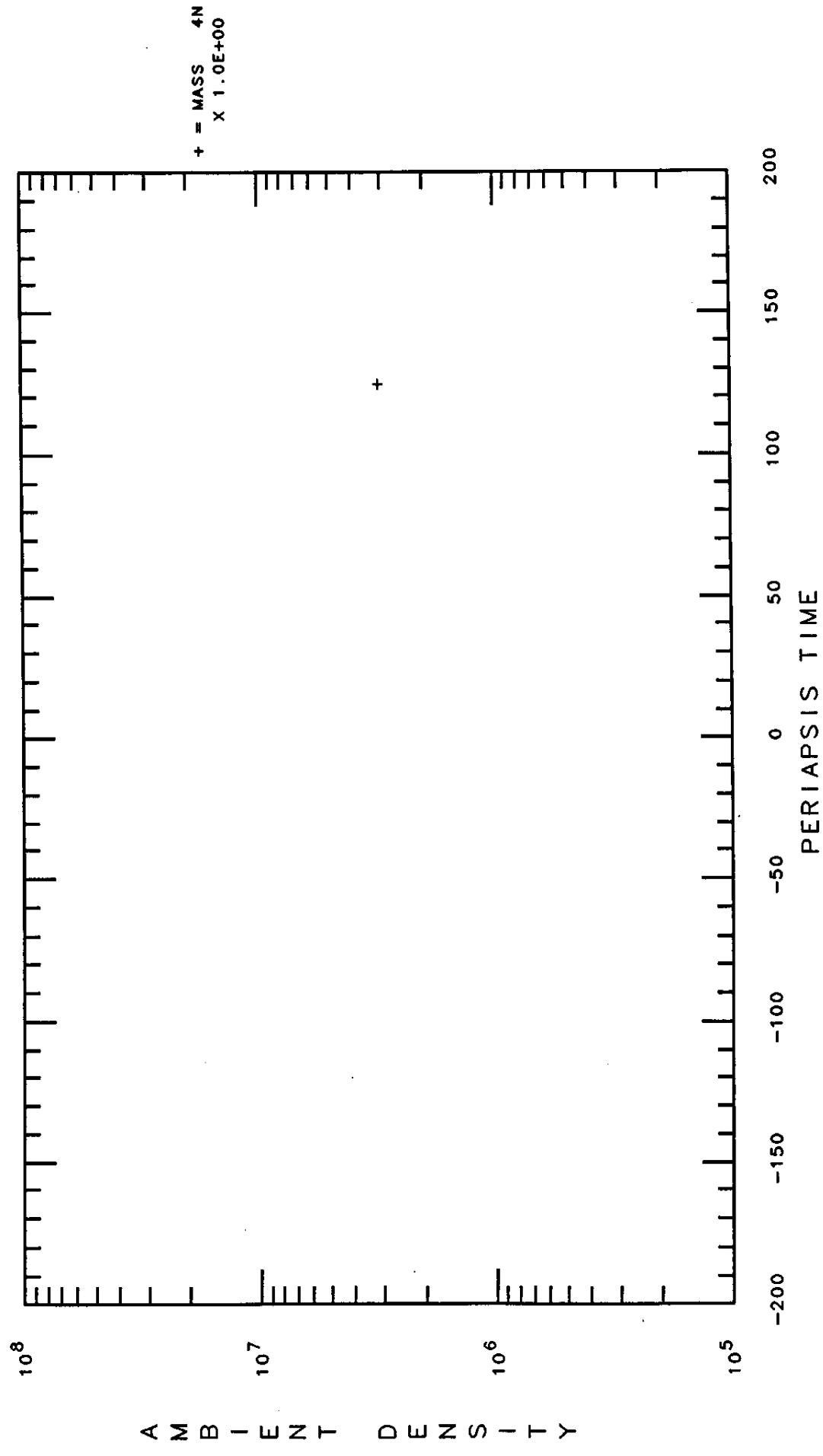
\*\*\*\*\*  
NOTE: PERIAPSIS NO LONGER BEING CONTROLLED; AS IT RISES THE ATMOSPHERE SIGNAL APPROACHES THE LOWER LIMIT MEASUREMENT THRESHOLD OF ONMS;  
ORBIT 620 IT IS 254 KM;  
\*\*\*\*\*

610 LOW ELECTRON ENERGY  
611 UNIT SWEEP  
618 UNIT SWEEP  
621-626 DATA BELOW MEASUREMENT THRESHOLD  
628-639 DATA BELOW MEASUREMENT THRESHOLD

ISOLATED POINT → ①

PV-ONMS DATA SUMMARY

NEW DATA

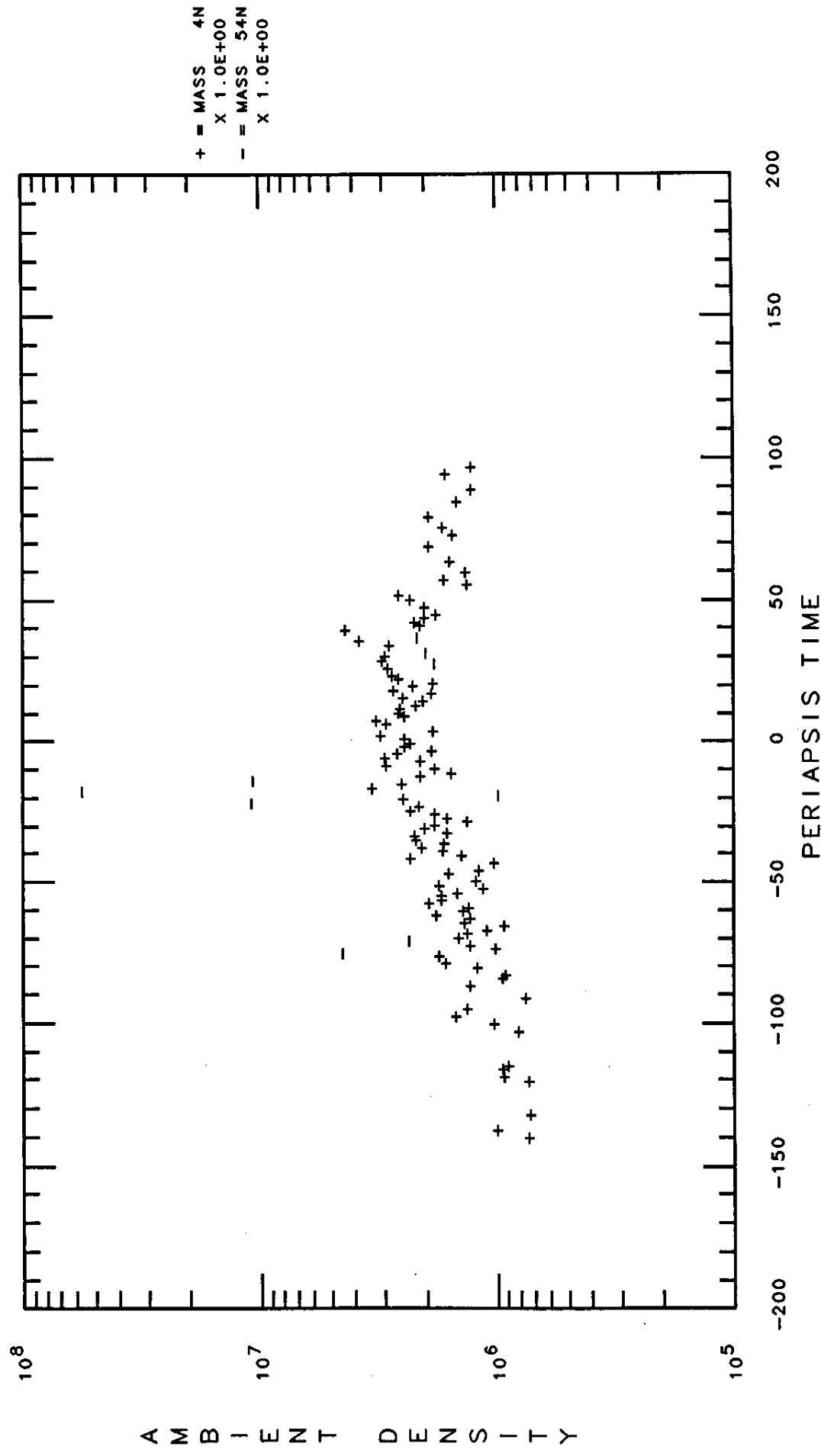


DATA SELECTION: ORBITS FROM 617. TO 617.

10:29:43  
08-DEC-68

PV-ONMS DATA SUMMARY  
NEW DATA

- HIGH RAM POINTS FOR HE  
ALL ANGLES OF ATTACK  
RAM POINTS MASS FLAGGED



DATA SELECTION: ORBITS

FROM 582. TO 582.

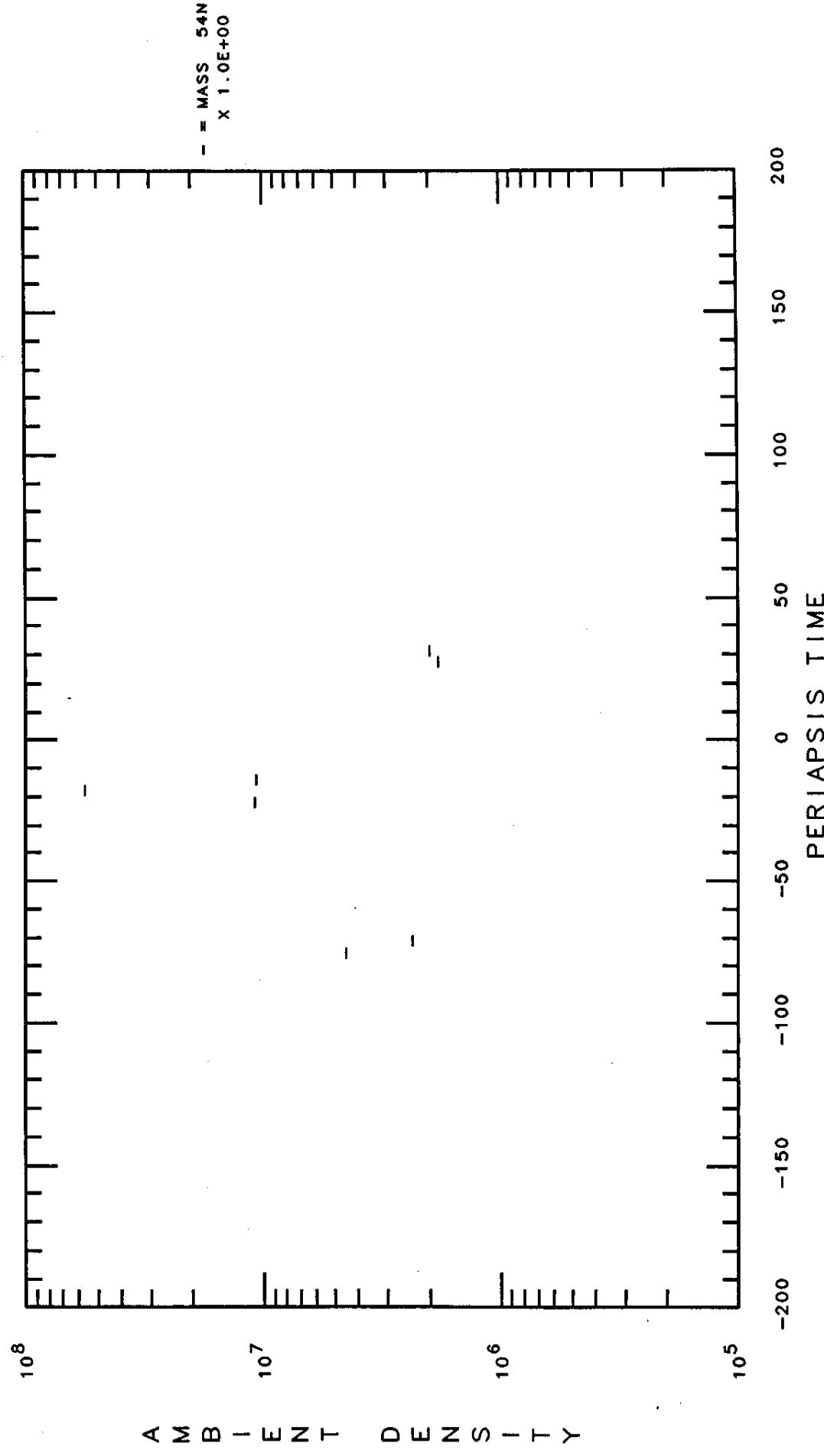
PERIAPSIS TIME

10:10:37  
08-DEC-88

PV-ONMS DATA SUMMARY

- HIGH RAM POINTS FOR He  
ANGLE OF ATTACK < 10°

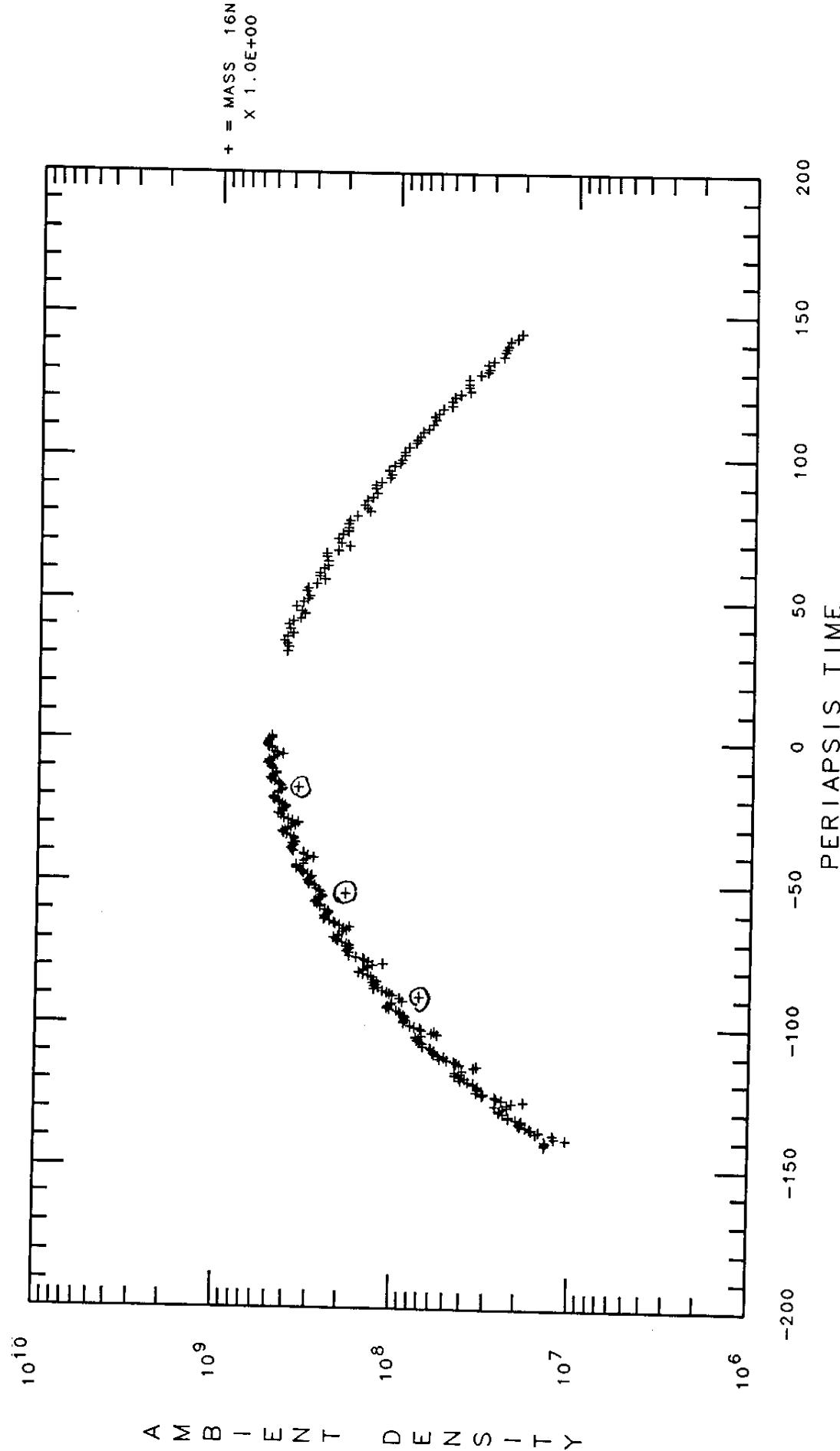
NEW DATA



PV-ONMS DATA SUMMARY

- 1) SPIN MODULATION OF DATA
- 2) DATA GAP
- 3) ANTENNA SHADOWED POINTS  
(circled)

EXL DATA



DATA SELECTION: ORBITS FROM 394. TO 394.

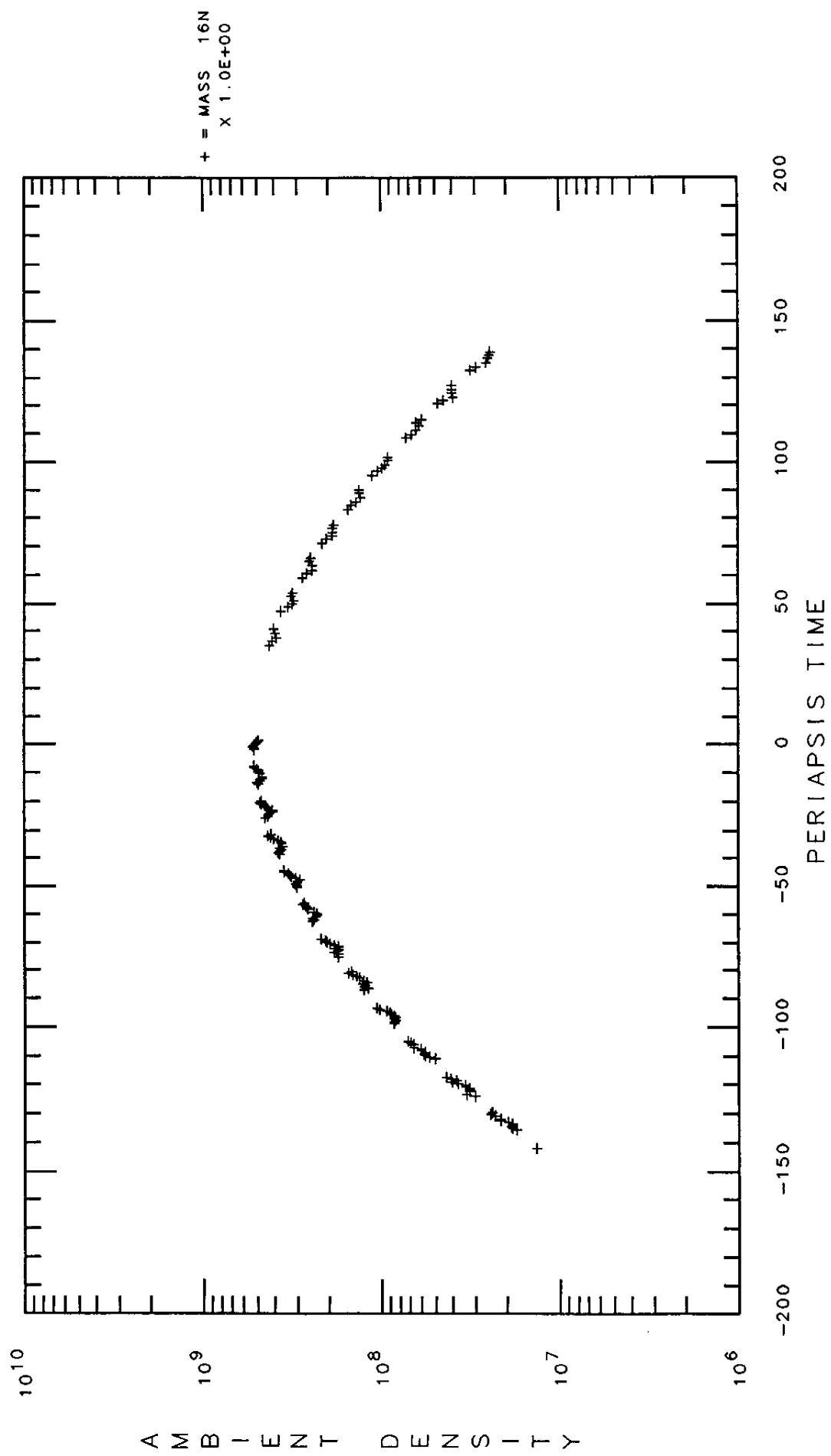
PERIAPSIS TIME

09:34:25  
08-DEC-88

PV-ONMS DATA SUMMARY

SAME AS 3a BUT FOR  
ANGLES OF ATTACK < 40°

NTE DATA



DATA SELECTION:

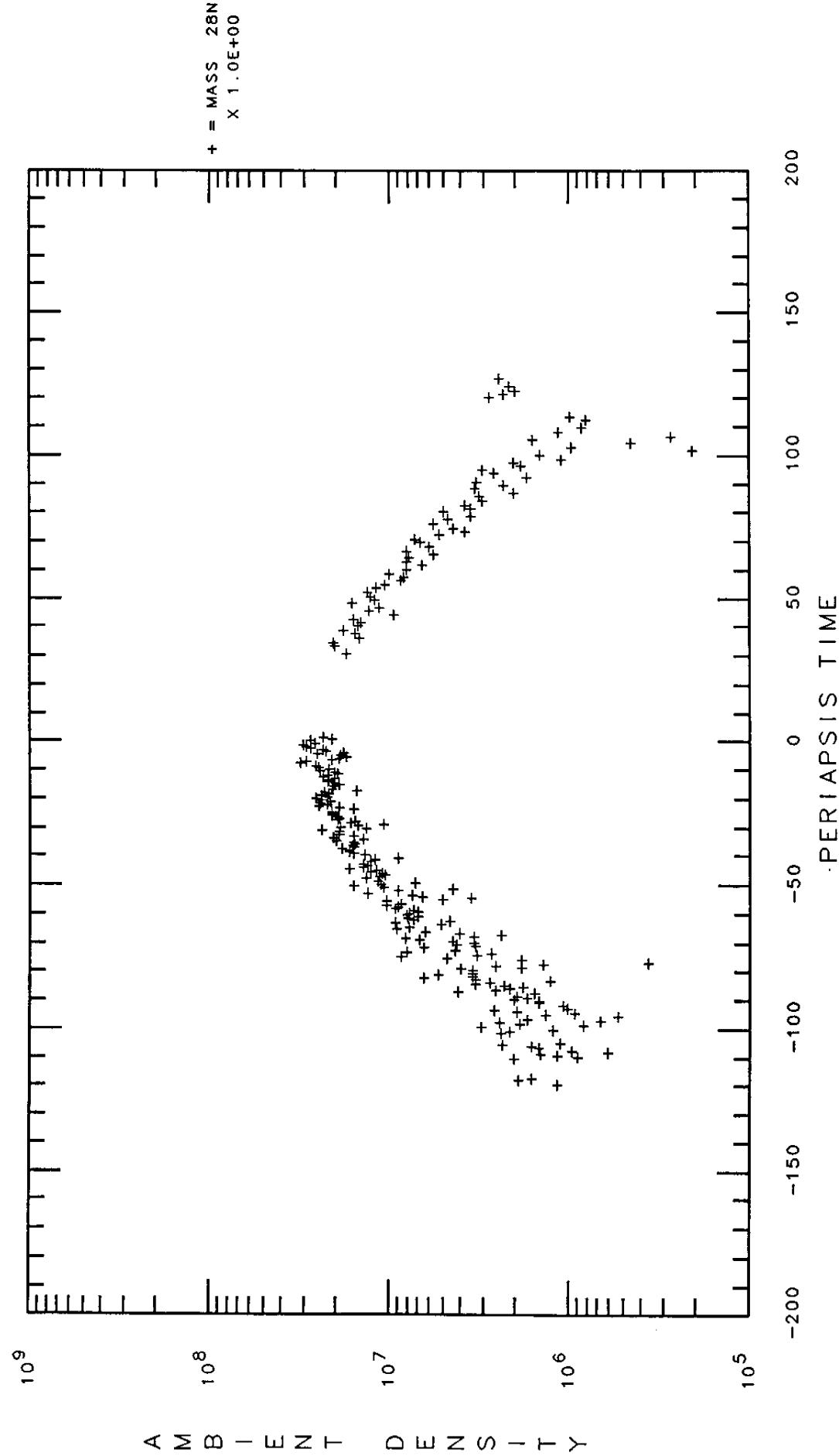
FROM 394. TO 394.  
FROM -40. TO 40.

10:02:54  
08-DEC-88

PV-ONMS DATA SUMMARY

OUTBOUND PROBLEM PARTS  
NEAR HIGH ALTITUDE CUTOFF

EXL DATA



## Purpose of Revised Pioneer Venus NSSDC Data Format

1. standardize and improve the data formats for each experiment so that the tapes can be easily read by a requestor.
2. store the data by experiment,
3. provide for orderly updating of data,
4. provide for ultimate replacement of existing UADS generated archival tapes.

A new format was designed which is to be used by each experimenter for PVO NSSDC data experimenter, and can be easily read by computers expected to be accessible to a requester. One major difference between this and the existing LFD format is the use of text (ASCII) data formats, eliminating both binary and IBM floating point formats.

The proposed new submission format is self-defining in the sense that the first three records on each tape define the data parameters, value representations, and missing data (file) indicators. The first tape record defines the order in which the variables appear in the subsequent data records, in a manner similar to that used for SEDR trajectory data (SEDR file 5). The second tape record will contain a FORTRAN-compatible format list describing the field sizes and representations of each data value in the order defined in record 1. This format may be used to decode all subsequent records on the tape.

The third tape record will define a unique value associated with filler (missing) data for all variable fields. It is formatted according to the format used in record 2, and is immediately followed by the start of actual data records (records 4 and beyond).

The following is the proposed new format, with examples as applied to OETP instructions.

### PROPOSED PIONEER VENUS NSSDC LOW-FREQUENCY DATA FORMAT

This document describes a suggested format to be used by all investigators for the submission of their data to the National Space Sciences Data Center. The overall specification will require that all data be coded into ASCII, and written onto standard 1/2 inch 1600-bpi 9-track tapes. The logical record length will be fixed for a given tape, as well as the physical blocksize. Blocksizes should be large enough to avoid wasting tape, but should not exceed 8000 bytes in order to avoid making excessive demands on user programs for memory. The first three records of any of these tapes will be formatted as follows:

Record 1: The format to be used is (~~I~~3,n(1X,A4)) where "n" is the number of data items in each record.

* 4	ELTE	ELNE	MI	VS				(for OETP)
7	ETEM	SPOT	TONE	TTWO	XVEL	YVEL	ZVEL	(for ORPA)
↑	↑	↑	↑	↑	↑	↑	↑	
3	5	10	15	20	25	30	35	

Example 1: The first record in each tape file. Note that new value types with new 4-character designations can be added as necessary. The date, time, orbit and time-tag items are not included in the list, because they are common to all data records.

\* number of data items "n"

Record 2: This record contains the format in which all succeeding records are written. The first 4 format items specify the date, time, orbit, and time-tag, and will appear in the same format on all tapes.

(I8,I9,I5,I6,4F9.2)	(Appropriate for OETP)
↑	
1	

Example 2: The second record in each tape file

Record 3: This record will contain zeroes for the first four fields (date, time, orbit, and time-tag), and in addition will have a fill value in each data value location. This value will be used by any program reading the data to identify fill data in subsequent input records.

0	0	0	0999999.99999999.99999999.99999999.99				
↑	↑	↑	↑	↑	↑	↑	
8	17	22	28	37	46	55	64

Example 3: The third record in each tape file. (Appropriate for OETP).

Record 4 to : These records contain the date, time, orbit, and time-tag for each time which has any non-fill data.

1981207	43527786	879	-1788	2345.67	78543.89999999.99	16.20
4	↑	↑	↑	↑	↑	↑
8	17	22	28	37	46	55
						64

Example 4: All records after the third in a tape file. (Appropriate for OETP).

As can be inferred from the above example, the date is coded as YEAR, DAY OF YEAR (1-366) with 19 included in the year. The time is in milliseconds of the day, orbit number is self-explanatory, and the time tag is the usual value ranging of the day from -1800 to 1800 in increments of 12.

The project-provided tape of SEDR information would be the source of the official dates and times to be used by all other investigators.

Nothing in the above format would preclude investigators from producing a tape containing the data from more than one experiment.

The external label on the tape should be type-written, and contain the following information:

- o Full name of experiment data contained on tape.<sup>1</sup>
- o Start date, time, and orbit number of data on the tape.
- o Stop date, time, and orbit number of data on the tape.
- o Production date of the tape.
- o The density (1600-bpi) and number of tracks (9) at which the tape was recorded.
- o An estimate of the amount of tape used.
- o The physical blocksize used in writing the tape.
- o A name and phone number of the individual responsible for the tape.

---

<sup>1</sup> Example: "Pioneer Venus Orbiter Electron Temperature Probe".

SNOF  
 \$NOP  
 1 \$NOP  
 2 ===== LIST OF OUT1  
 3 \$EXE TFLIST AS  
 4  
 5 INPUT PARAMETERS ARE: AS FL=5=5 2 1 1  
 6

D - 85 845  
 12/7/78 - 9/5/80

TAPE NO. 1 FILE NO. 1

RECORD 1 LENGTH 1.16

2 DATE CN DC DN2 DCC DRHC DTOT  
 4digit Year Day C18.19.15.10.19.E)

5 6 0.00E+01 0.00E+01 0.00E+01 0.00E+01 0.00E+01 0.00E+01 0.00E+01 0.00E+01  
 12 -1 1978341 52247401 3 -72 0.00E+01 2.75E+05 0.00E+01 3.87E+06 2.06E+06 0.00E+01 0.00E+01  
 13 E-11 1978341 52259100 3 -61 0.00E+01 4.16E+15 0.00E+01 5.05E+06 3.21E+06 0.00E+01 0.00E+01  
 14 E-11 1978341 52271000 3 -48 0.00E+01 5.47E+05 2.52E+06 7.17E+06 4.77E+16 8.13E+16 1.  
 15 5.0E+07 1978341 52295100 3 -36 1.68E+06 0.00E+01 6.00E+05 3.47E+06 8.69E+06 1.07E+15 2.  
 16 5.1E+07 1978341 52307100 3 -24 0.00E+01 7.05E+05 3.96E+06 8.48E+06 1.27E+15  
 17 2.28E+07 1978341 52337600 3 -12 0.00E+01 9.50E+05 4.99E+06 1.02E+07 1.06E+07 1.46E+15  
 18 2.58E+07 1978341 52337116 3 0.00E+01 9.00E+05 4.69E+06 1.02E+07 1.06E+07 1.46E+15  
 19 5.20E+17

TAPE NO. 1 FILE NO. 1

RECORD 2 LENGTH 1.16

23 1978341 52379000 3 72 0.00E+01 0.00E+01 3.47E+05 0.00E+01 3.31E+06 4.81E+06 0.00E+01 0.00E+01  
 24 1.1978341 52391000 3 84 0.00E+01 2.30E+05 0.00E+01 0.00E+01 3.87E+06 0.00E+01 0.00E+01  
 25 -1.1978342 52714816 4 -11 8 0.00E+01 0.00E+01 2.65E+05 0.00E+01 3.45E+06 4.76E+06 0.00E+01 0.00E+01  
 26 -1.1978342 52738816 4 -84 1.42E+06 0.00E+01 8.83E+05 0.00E+01 6.54E+06 8.14E+06 0.00E+01 0.00E+01  
 27 E-11 1978342 52738816 4 -72 1.46E+06 0.00E+01 1.25E+06 4.23E+06 1.65E+07 1.53E+07 1.60E+15 2.8  
 28 7E+7 1978342 52751816 4 -63 1.43E+06 6.00E+05 0.00E+01 1.99E+06 7.09E+06 2.65E+07 1.73E+07 2.42E+15 4.  
 29 27E+7 1978342 52762816 4 -48 1.52E+06 0.00E+01 2.66E+06 1.31E+07 2.92E+07 3.75E+15 6.  
 30 0.61E+07 1978342 52774816 4 -36 1.56E+06 0.00E+01 3.54E+06 1.50E+07 4.80E+07 5.58E+07 7.11E+15  
 31 9.37E+07 1978342 52786816 4 -24 1.59E+06 0.00E+01 4.00E+06 1.50E+07 4.80E+07 5.58E+07 7.11E+15  
 32 1.24E+08 1978342 52798816 4 -12 1.67E+06 0.00E+01 5.00E+06 1.50E+07 5.88E+07 6.89E+07 8.73E+15  
 33 5.152E+08

TAPE NO. 1 FILE NO. 1

RECORD 3 LENGTH 1.16

37 1978343 53183661 5 -138 0.00E+01 4.86E+05 0.00E+01 4.25E+06 0.00E+01 0.00E+01  
 38 1.1978343 53195040 5 -96 1.39E+06 0.00E+01 1.96E+06 0.00E+01 2.05E+06 1.12E+06 7.62E+06 0.00E+01 0.00E+01  
 39 0.1978343 53207406 5 -84 1.21E+06 0.00E+01 3.74E+06 4.05E+06 1.03E+07 1.88E+07 2.15E+15 3.81  
 40 +0.1978343 53219000 5 -72 1.37E+06 0.00E+01 6.56E+06 6.44E+06 1.64E+07 2.73E+07 3.24E+15 5.8  
 41 E+07 1978343 53243500 5 -60 1.43E+06 0.00E+01 1.07E+07 9.18E+06 2.32E+07 3.81E+07 4.62E+15 8.  
 42 3.3E+07 1978343 53255000 5 -48 1.59E+06 0.00E+01 1.54E+07 1.54E+07 3.24E+07 4.85E+07 6.05E+15 1.  
 43 0.10E+06 1978343 53267000 5 -36 1.56E+06 0.00E+01 2.12E+07 1.65E+07 6.14E+07 6.79E+15  
 44 0.43E+08 1978343 53279000 5 -24 1.56E+06 0.00E+01 2.78E+07 2.11E+07 5.72E+07 7.58E+07 9.92E+15  
 45 0.183E+08 1978343 53291000 5 -12 1.67E+06 0.00E+01 2.38E+07 6.38E+07 6.38E+07 6.00E+01 0.00E+01  
 46 0.147E+08 1978343 54116816 7 -144 0.00E+01 4.67E+05 0.00E+01 1.10E+06 0.00E+01 0.00E+01  
 47 1.00E+01

TAPE NO. 1 FILE NO. 1

RECORD 4 LENGTH 1.16

51 1978344 53807000 6 36 0.00E+01 0.00E+01 5.56E+07 7.34E+07 0.00E+01 4.72E+07 0.00E+01 0.00E+01  
 52 1.1978344 53819000 6 48 0.00E+01 0.00E+01 4.37E+07 7.09E+07 0.00E+01 3.73E+07 1.00E+01 0.00E+01  
 53 0.1978344 53831000 6 61 0.00E+01 3.00E+01 9.13E+07 3.062E+07 0.00E+01 2.00E+01 0.00E+01 0.00E+01  
 54 -0.1978344 53843000 6 72 1.46E+06 0.00E+01 2.91E+07 0.00E+01 1.29E+07 2.41E+07 0.00E+01 0.00E+01  
 55 0.1978344 53855000 6 84 1.50E+06 0.00E+01 2.17E+06 8.28E+06 1.83E+07 2.50E+15 5.3  
 56 0.9E+07 1978344 53867000 6 96 1.39E+06 0.00E+01 1.53E+07 2.47E+06 5.19E+06 1.33E+07 1.75E+15 7.  
 57 7.7E+07 1978344 53879000 6 108 1.11E+06 0.00E+01 9.61E+06 1.00E+01 0.00E+01 5.15E+06 0.00E+01 0.00E+01  
 58 0.1978344 53891000 6 120 1.22E+06 0.00E+01 5.43E+06 0.00E+01 1.00E+01 6.35E+06 0.00E+01 0.00E+01  
 59 0.20E+01 1978344 53913000 6 132 0.00E+01 3.00E+01 0.00E+01 4.37E+06 0.00E+01 0.00E+01 0.00E+01  
 60 0.10E+01 1978345 54116816 7 -144 0.00E+01 4.67E+05 0.00E+01 1.10E+06 0.00E+01 0.00E+01  
 61 1.00E+01

TAPE NO. 1 FILE NO. 1

RECORD 5 LENGTH 1.16

Pinoel  
Venus

PIONEER VENUS 1

12 SECOND B & E FIELD DATA 1 HOUR AROUND PERIAPSIS

78-051A-12F  
78-051A-13E

This dataset consists of eleven 9-track tapes. 4 tapes are 1600 BPI, while the other seven are 6250 BPI. The tapes are ASCII and were created on the IBM computer.  
Each file contains 8 physical records (or blocks) which are 6080 bytes long. Each physical record contains 38 logical records which are 160 bytes long. The logical records are arranged as follows:

Record 1: Data headers  
Record 2: Fortran Format  
Record 3: Data Fill examples  
Record 4: Time, Orbit, T-Peri, Data

Each file contains data for one orbit, one hour about periapsis (i.e. 2 hours of data within the nominal Venusian ionosphere). The data are 24 second averages taken 12 seconds apart.

The "D" and "C" numbers along with their time spans are as follows:

D#	C#	TIME SPAN	FILES	ORBIT #
D-66729	C-24987	12/05/78 - 04/18/80	500	1- 500
D-66730	C-24988	04/19/80 - 09/01/81	500	501-1000
D-74127	C-26131	09/02/81 - 01/14/83	500	1001-1500
D-74128	C-26132	01/15/83 - 05/28/83	500	1501-2000
D-83252	C-29214	05/28/84 - 01/17/86	600	2001-2600
D-98900	C-29873	01/30/86 - 02/22/87	388	2613-3000
D-98901	C-29874	02/22/87 - 08/25/88	550	3001-3550
D-101566	C-031192	08/26/88 - 10/16/88	52	3551-3602
D-101567	C-031193	10/17/88 - 06/06/90	598	3603-4200
D-101568	C-031194	06/07/90 - 07/11/91	399	4201-4600
D-101569	C-031195	07/12/91 - 10/08/92	455	4601-5055

PIONEER VENUS ORBITER  
 MAGNETOMETER AND ELECTRIC FIELD DETECTOR  
 LOW-FREQUENCY DATA SUBMISSION TO  
 NATIONAL SPACE SCIENCE DATA CENTER

7P-051A-12F  
 7P-051A-13E

Parameters on NSSDC Low-frequency Data Tape

This tape contain 24 second overlapped averages, every 12 seconds of both the PVO magnetometer (OMAG) and electric field data (Oefd), for an hour centered around the periapsis of each orbit for orbits 4201-4600. The time epochs were provided by the Pioneer Project at Ames Research Center.

During orbit 3602, the spin-plane magnetometer sensors failed, and so after this orbit the magnetic field data columns contain only the Bz component. We receive 3 values for the P-sensor (Bz) rather than 1 value for Bx, By and Bz. Due to this, the columns for Bx, By, Bt and DBTL are all flagged. We've left the columns in the files so they are the same format as orbits 1-3602. The magnetometer data for these orbits are in spacecraft coordinates. Also included are the standard deviations of Bz.

The Oefd data consists of the 24 second maximum and average from each of the four Oefd channels, in units of volts per meter per square root hertz. The four frequency bands are centered around 100 Hz, 730 Hz, 5.4kHz and 30kHz.

Tape Format

These tapes were created using the ASCII format described in "Pioneer Venus Mission Instructions for Data Submissions to the National Space Science Data Center". This document should be referenced for general tape information.

The tapes are standard 1/2 inch, 9 track, 6250 bpi, unlabeled, ASCII, with fixed length blocked records. The record length is 160 bytes, in blocks of 38, for a blocksize of 6080 bytes. There is a record for each 12 second interval for an hour about periapsis, resulting in 301 data records per orbit. With 3 header records there are then 304 records per orbit, which fill 8 complete blocks. There is a tape mark after the last record of each orbit, which splits the tape into 399 files with a double tape mark after the last file.

NOTE: There is no file for orbit 4435.

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PVO OMAG & Oefd LOW-FREQUENCY DATA TAPE

As specified in the "Pioneer Venus Mission Instructions for Data Submissions to the NSSDC" the first three records are information on the format of the data.

- Record #1: Format: (I3,14(1x,A4)) Gives the number of data columns in each data record (14), and 4 character descriptors for each.
- Record #2: Format: (A160) Gives the Fortran format to be used in reading each data record.
- Record #3: Fortran format is given in record #2. Contains the fill values which occur when no data is available.
- Record #4-end: Time, orbit, seconds from periapsis, data.

\*\*\*\*\*

ITEM	CONTENTS	FORMAT	EXAMPLE	FILL
1	YEAR * 1000 + DAY OF YEAR	I8	b1984001	0
2	MILLISECONDS OF DAY	I9	b86400000	0
3	ORBIT NUMBER	I5	b1901	0
4	SECONDS FROM PERIAPSIS	I6	-43200	0
5	BX AVERAGE (all flags)	F7.2	b-10.10	b999.00
6	BY AVERAGE (all flags)	"	"	"
7	BZ AVERAGE (P-sensor avg. S/C in "	"	"	"
8	BT AVERAGE (all flags) GAMMAS "	"	"	"
9	SD OF COMPONENTS (P-sensor avg)	"	"	"
10	SD OF TOTAL (all flags)	"	"	"
11	100 HZ ELEC MAX (V/(M*HZ**.5))	E10.3	b0.333E-07	1.0E+32
12	100 HZ ELEC AVERAGE	"	"	"
13	730 HZ ELEC MAX	"	"	"
14	730 HZ ELEC AVE	"	"	"
15	5.4 KHZ ELEC MAX	"	"	"

12F  
13E

2

16 5.4 KHZ ELEC AVE " " "  
17 30 KHZ ELEC MAX " " "  
18 30 KHZ ELEC AVE " " "  
19 BLANK FILL 10X  
TOTAL CHARACTERS - 160  
\*\*\*\*\*

## SAMPLE UADS FILE FOR ORBITS 3551-3602

S - 1

DATA = u3551.ffd  
 CDATE = 90 054 FEB 23 10:03:27 UPDATE = 90 054 FEB 23 10:03:35  
 RECL = 269

LS = 20

NROWS = 301

OPSYs = SUN/UNIX

#	NAME	UNITS	SOURCE	FORMAT
001	UT	YR MON DY	HR MN SC MS	6I3.2,I4.3
002	BX VSO	NT	PVO OMAG	G13.5
003	BY VSO	NT	PVO OMAG	G13.5
004	BZ VSO	NT	PVO OMAG	G13.5
005	BT	NT	PVO OMAG	G13.5
006	VSOX	RV	PVO SEDR/UCLA	G13.5
007	VSOY	RV	PVO SEDR/UCLA	G13.5
008	VSOZ	RV	PVO SEDR/UCLA	G13.5
009	PLAT	DEG	PVO SEDR/UCLA	G13.5
010	PLON	DEG	PVO SEDR/UCLA	G13.5
011	DBTR	NT	PVO SD OF B COMPONENTS	G13.5
012	DBTL	NT	PVO SD OF B TOTAL	G13.5
013	E100 MAX	V/M/RTHZ	PVO OEOFD 100HZ CHANNEL	G13.5
014	E100 AVG	V/M/RTHZ	PVO OEOFD 100 HZ CHANNEL	G13.5
015	E730 MAX	V/M/RTHZ	PVO OEOFD 730 HZ CHANNEL	G13.5
016	E730 AVG	V/M/RTHZ	PVO OEOFD 730 HZ CHANNEL	G13.5
017	E5.4KMAX	V/M/RTHZ	PVO OEOFD 5.4K HZ CHANNEL	G13.5
018	E5.4KAVG	V/M/RTHZ	PVO OEOFD 5.4K HZ CHANNEL	G13.5
019	E30K MAX	V/M/RTHZ	PVO OEOFD 30K HZ CHANNEL	G13.5
020	E30K AVG	V/M/RTHZ	PVO OEOFD 30K HZ CHANNEL	G13.5

ABSTRACT

FIRST TIME = 88 239 AUG 26 02:17:25.415

LAST TIME = 88 239 AUG 26 03:17:25.415

OWNER = GORDON

MISSING DATA FLAG = 1.000000E+32

ORBIT NUMBER(S) = 3551

ORBIT START TIME NREC

PVO UADS DATA - 12 SEC AVERAGES 1 HOUR ABOUT PERIAPSIS

Periapsis time: 88 239 AUG 26 02:47:25.415

NSSFF: 90 052 FEB 21 18:55:42.330

PVO OETP data received Jan 02, 1990 via SPAN mail.

MERGE: 90 053 FEB 22 08:28:56

Data columns extracted from DISK\$SCRATCH:[GORDON.OETP]OETPO.FFH;1

FFMERGE: 90 054 FEB 23 10:03:28

Files A & B merged (nearest points from B)

File A: QSA2:[PVO.UADS]Y3551.FFH;1

File B: DISK\$SCRATCH:[GORDON.OETP]OETP.FFH;1

A columns: 1 - 20

B columns: 21 - 23

END

FORTRAN FORMAT:

(6I3.2,I4.3,19G13.5)

MISSING DATA FLAGS:

00 00 00 00 00 000 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33  
 E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33  
 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33

DATA:

88	08	26	02	17	25	415	11.929	-6.4944	-5.6719	14.863	0.52416	0.50853
	1.9389		68.706	67.441			2.2697	0.89698		0.15350E-03	0.53216E-04	
	0.12478E-04	0.80742E-05	0.14739E-05	0.12898E-05	0.32623E-04		0.71307E-05					
88	08	26	02	17	37	415	12.287	-6.6868	-5.1625	15.090	0.53274	0.50735
	1.9291		68.494	66.851			2.5602	1.0308	0.47323E-03	0.72020E-04		
	0.13479E-04	0.83521E-05	0.18433E-05	0.13380E-05	0.32623E-04	0.53662E-05						
88	08	26	02	17	49	415	12.144	-7.4500	-4.6707	15.274	0.54131	0.50615
	1.9192		68.280	66.267	3.2585		1.3915	0.60776E-03	0.10911E-03			
	0.16347E-04	0.90034E-05	0.67950E-05	0.16462E-05	0.22435E-04	0.31645E-05						
88	08	26	02	18	01	415	12.165	-7.3945	-4.7181	15.371	0.54987	0.50494
	1.9092		68.061	65.691	3.8349		1.7655	0.60776E-03	0.11919E-03			
	0.19825E-04	0.93375E-05	0.17909E-04	0.21872E-05	0.22435E-04	0.33034E-05						
88	08	26	02	18	13	415	12.356	-7.0215	-4.5552	15.291	0.55842	0.50372
	1.8993		67.840	65.121	3.8544		1.8782	0.45390E-03	0.10301E-03			
	0.19825E-04	0.88679E-05	0.17909E-04	0.21072E-05	0.22435E-04	0.38103E-05						
88	08	26	02	18	25	415	11.840	-7.6666	-3.3047	14.889	0.56695	0.50248
	1.8892		67.614	64.558	3.8173		1.5850	0.41758E-03	0.10939E-03			
	0.14560E-04	0.84276E-05	0.54332E-05	0.17172E-05	0.20052E-04	0.43844E-05						
88	08	26	02	18	37	415	11.524	-7.9920	-2.3347	14.549	0.57546	0.50123
	1.8792		67.385	64.002	3.4306		1.4183	0.41758E-03	0.12777E-03			
	0.19825E-04	0.86016E-05	0.15429E-04	0.21001E-05	0.19315E-04	0.38766E-05						

88	08	26	02	18	49	415	12.504	-7.0965	-3.9372	15.338	0.58396	0.49997
						1.8690	67.153	63.453	4.0800	1.8275	0.41758E-03	0.14340E-03
0.34024E-04	0.94414E-05	0.15429E-04	0.24545E-05	0.20052E-04	0.30038E-05							
88	08	26	02	19	01	415	12.750	-6.6224	-4.3016	15.356	0.59245	0.49870
						1.8589	66.917	62.911	3.8877	2.0007	0.40053E-03	0.13108E-03
0.34024E-04	0.92763E-05	0.73209E-05	0.20780E-05	0.23291E-04	0.35882E-05							
88	08	26	02	19	13	415	11.698	-7.3801	-2.2878	14.309	0.60092	0.49741
						1.8486	66.677	62.375	3.3282	1.6371	0.40053E-03	0.95494E-04
0.14560E-04	0.82771E-05	0.45094E-05	0.15582E-05	0.23291E-04	0.31306E-05							
88	08	26	02	19	25	415	11.537	-7.6560	-1.0969	14.117	0.60938	0.49611
						1.8384	66.434	61.845	2.7907	1.1361	0.33899E-03	0.76555E-04
0.14560E-04	0.78273E-05	0.18433E-05	0.13370E-05	0.22435E-04	0.35479E-05							
88	08	26	02	19	37	415	12.244	-6.0923	0.46395	14.078	0.61782	0.49480
						1.8281	66.187	61.322	3.5012	1.0368	0.33899E-03	0.64168E-04
0.14560E-04	0.75403E-05	0.17759E-05	0.13016E-05	0.22435E-04	0.36478E-05							
88	08	26	02	19	49	415	10.462	-5.3548	4.3894	13.669	0.62624	0.49348
						1.8177	65.937	60.806	5.9408	2.2836	0.41758E-03	0.91204E-04
0.13479E-04	0.77981E-05	0.16483E-05	0.13105E-05	0.94834E-05	0.22858E-05							
88	08	26	02	20	01	415	4.6609	-3.8255	10.953	14.274	0.63464	0.49214
						1.8073	65.684	60.296	7.5355	2.8915	0.41758E-03	0.10492E-03
0.15133E-04	0.84071E-05	0.16483E-05	0.13449E-05	0.91349E-05	0.14342E-05							

## SAMPLE UADS FILE FOR ORBITS 3603-5055

DATA = u3809.ffd  
 CDATE = 91 205 JUL 24 14:22:20  
 RECL = 269

LS = 20  
 NJWS = 301  
 OPSYS = SUN/UNIX

#	NAME	UNITS	SOURCE	FORMAT
001	UT	YR MON DY	HR MN SC MS	6I3.2,I4.3
002	BX SC	NT	PVO	G13.5
003	BY SC	NT	PVO	G13.5
004	BZ SC	NT	PVO MAG Pav along Z	G13.5
005	BT	NT	PVO MAG Pav along Z	G13.5
006	VSOX	RV	PVO SEDR	G13.5
007	VSOY	RV	PVO SEDR	G13.5
008	VSOZ	RV	PVO SEDR	G13.5
009	PLAT	DEG	PVO SEDR Planetary lat	G13.5
010	PLON	DEG	PVO SEDR Planetary long	G13.5
011	DBTR	NT	PVO MAG Pav along Z	G13.5
012	DBTL	NT	PVO MAG Pav along Z	G13.5
013	E100 MAX	V/M/rthz	PVO EFD	G13.5
014	E100 AVG	V/M/rthz	PVO EFD	G13.5
015	E730 MAX	V/M/rthz	PVO EFD	G13.5
016	E730 AVG	V/M/rthz	PVO EFD	G13.5
017	E5.4KMAX	V/M/rthz	PVO EFD MAX	G13.5
018	E5.4KAVG	V/M/rthz	PVO EFD	G13.5
019	E30K MAX	V/M/rthz	PVO EFD	G13.5
020	E30K AVG	V/M/rthz	PVO EFD	G13.5

## ABSTRACT

FIRST TIME = 89 131 MAY 11 02:57:07.595

LAST TIME = 89 131 MAY 11 03:57:07.595

OWNER = debbie

MISSING DATA FLAG = 1.00000E+32

AVERAGE INTERVAL = 00:00:24.000

ORBIT NUMBER(S) = 3809

PVO EDR DATA PROCESSING, VERSION 1.5, UCLA, DATE: 91 205 JUL 24

PVOFLAGCAL: 91 205 JUL 24

Magnetic field data flagged during calibrate interval.

AVG: 91 205 JUL 24 14:21:48

Input file: hima3809.ffd...

Output file: /scratch/debbie/uads\_mag3809.ffd

Processing options: AVG RMSDEV COUNT

Window width(sec)= 24.000 Output res= 12.000

Min pts= 1.00

ffcalc: 91 205 JUL 24 14:21:54

Input file: /scratch/debbie/uads\_mag3809.ffd

Output file: /scratch/debbie/uads\_magsd3809.ffd

out: c1;

"BX SC" "NT" = FLAG;

"BY SC" "NT" = FLAG;

c2:

"BT" "NT" = FLAG;

"SDBZ" "NT"= sqrt((c3\*c3) \* c4 / (c4-1.) );

"SDBT" "NT"= FLAG;

PVO EDR DATA PROCESSING, VERSION 1.5, UCLA, DATE: 91 205 JUL 24

ffcalc: 91 205 JUL 24 14:22:00

Input file: hiel3809

Output file: /scratch/debbie/hiel\_rt3809.ffd

var: skip {c1< 89 131 MAY 11 02:56:55.595"};

var: stop {c1> 89 131 MAY 11 03:57:19.595"};

out: c1;

"E100HZ" "V/M/HZ.5"=sqrt(c2);

"E730HZ" "V/M/HZ.5"=sqrt{c3};

"E5.4KHZ" "V/M/HZ.5"=sqrt(c4);

"E30KHZ" "V/M/HZ.5"=sqrt(c5);

FFAVG: 91 205 JUL 24 14:22:01

Input file: /scratch/debbie/hiel\_rt3809.ffd...

Output file: /scratch/debbie/uads\_ele3809.ffd

Processing options: MAX AVG

Window width(sec)= 24.000 Output res= 12.000

Min pts= 1.00 1.00 1.00 1.00

FFMERGE: 91 205 JUL 24 14:22:07

Files A & B merged (A union B)

File A: /scratch/debbie/uads\_magsd3809.ffd

File B: /scratch/debbie/uads\_ele3809.ffd

A columns: 1 - 7

B columns: 8 - 15  
 PVO EDR DATA PROCESSING, VERSION 1.5, UCLA, DATE: 91 205 JUL 24  
 EPHFLAGDUP: 91 205 JUL 24  
 No duplicate ephemeris records found.  
 FFMERGE: 91 205 JUL 24 14:22:13

Files A & B merged (quadratic interpolation of B)  
 File A: /scratch/debbie/uads\_magele3809.fff  
 File B: ephe3809.fff ...  
 A columns: 1 - 15  
 B columns: 16 - 20  
 ffcalc: 91 205 JUL 24 14:22:20  
 Input file: /scratch/debbie/uads\_mageleeph3809.fff  
 Output file: /prod/pvo/uads/u3809.fff  
 out: c1; c2; c3; c4; c5;  
 "VSOX" "RV" = c16;  
 "VSOY" "RV" = c17;  
 "VSOZ" "RV" = c18;  
 "PLAT" "DEG" = c19;  
 "PLON" "DEG" = c20;  
 "DBTR" "NT" = c6;  
 "DBTL" "NT" = c7;  
 "E100 MAX" "V/M/rtHZ" = c8;  
 "E100 AVG" "V/M/rtHZ" = c9;  
 "E730 MAX" "V/M/rtHZ" = c10;  
 "E730 AVG" "V/M/rtHZ" = c11;  
 "E5.4KMAX" "V/M/rtHZ" = c12;  
 "E5.4KAVG" "V/M/rtHZ" = c13;  
 "E30K MAX" "V/M/rtHZ" = c14;  
 "E30K AVG" "V/M/rtHZ" = c15;

END

FORTRAN FORMAT:  
(6I3.2,I4.3,19G13.5)

MISSING DATA FLAGS:

00 00 00 00 00 000 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33  
 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33  
 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33 0.10000E+33

DATA:

89 05 11 02 57 07 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.70199	-0.11957
1.9289	69.094	89.502	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
05 11 02 57 19 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.70611	-0.12706
1.9189	68.881	88.905	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 57 31 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.71021	-0.13455
1.9088	68.665	88.316	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 57 43 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.71430	-0.14204
1.8987	68.445	87.734	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 57 55 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.71836	-0.14952
1.8885	68.221	87.159	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 58 07 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.72241	-0.15700
1.8783	67.994	86.591	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 58 19 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.72644	-0.16447
1.8680	67.763	86.030	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 58 31 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.73045	-0.17194
1.8577	67.528	85.476	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 58 43 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.73445	-0.17941
1.8474	67.290	84.929	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 58 55 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.73842	-0.18687
1.8370	67.048	84.389	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 59 07 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.74237	-0.19432
1.8265	66.803	83.855	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 59 19 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.74630	-0.20177
1.8160	66.553	83.328	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 59 31 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.75021	-0.20922
1.8055	66.301	82.808	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 59 43 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.75411	-0.21666
1.7949	66.044	82.294	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33
0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33		
89 05 11 02 59 55 595	0.10000E+33	0.10000E+33	0.10000E+33	0.10000E+33	0.75798	-0.22409

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## ASCII LIST OF km2002

orbits 35551-3602

FILE 1 RECORD 1 6080 BYTES

	14	EX	BY	BZ	BT	SDBC	SDBT	100M	100A	730M	730A	5.4K	30KM	30KA	SOURCE:	PVO	OMAG/DEFD	DATE:
	(18,19,15,16,6F7,2,8E10,3,10X)																	
E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0.100E+33	0	0	0	999.00
7	14.86	2.27	-0.90	0.153E-03	0.532E-04	0.125E-04	0.807E-05	0.147E-05	0.129E-05	0.125E-04	0.125E-04	0.125E-04	0.125E-04	0.125E-04	0.125E-05	11.93	-6.49	-5.6
51	-17.88	12.29	-6.69	-5.16	15.09	2.56	1.03	0.473E-03	0.720E-04	0.135E-04	0.135E-04	0.135E-04	0.135E-04	0.135E-04	0.134E-05	19.8239	82574	15.35
65E-05	0.224E-04	0.316E-05	1.776	12.14	-7.45	-4.67	15.27	3.26	1.39	0.608E-03	0.109E-03	0.163E-04	0.900E-05	0.608E-03	0.679E-05	0.1	0.537E-04	0.537E-05
E-04	0.934E-05	0.179E-04	0.219E-05	0.224E-04	0.330E-05	1.988239	8281415	3551	-17.64	1.2.17	-7.39	-4.72	15.37	3.83	1.77	0.608E-03	0.119E-03	0.198
88	0.454E-03	0.103E-03	0.198E-04	0.887E-05	0.179E-04	0.211E-05	0.224E-04	0.381E-05	1.988239	8293415	3551	-17.52	12.36	-7.02	-4.56	15.29	3.85	1.
67	-3.30	14.89	3.82	1.58	0.418E-03	0.109E-03	0.146E-04	0.843E-05	0.543E-05	0.172E-05	0.201E-04	0.438E-05	0.210E-05	0.193E-04	0.193E-04	0.193E-04	0.193E-04	0.193E-04
174.15	3551	-17.28	11.52	-7.99	-2.33	14.55	3.43	1.42	0.418E-03	0.128E-03	0.198E-04	0.860E-05	0.154E-04	0.210E-05	0.210E-05	0.210E-05	0.210E-05	0.210E-05
68E-05	1.988239	8329415	3551	-17.16	12.50	-7.10	-3.94	15.34	4.08	1.83	0.418E-03	0.143E-03	0.340E-04	0.944E-05	0.154	0.143E-03	0.143E-03	0.143E-03
E-04	0.245E-05	0.201E-04	0.300E-05	1.988239	8341415	3551	-17.04	12.75	-6.62	-4.30	15.36	3.89	2.00	0.401E-03	0.131E-03	0.131E-03	0.131E-03	0.131E-03
03	0.340E-04	0.928E-05	0.732E-05	0.208E-05	0.233E-04	0.359E-05	1.988239	8353415	3551	-16.92	11.70	-7.38	-2.29	14.31	3	0.313E-04	0.313E-05	0.313E-05
.33	1.64	0.401E-03	0.955E-04	0.146E-04	0.828E-05	0.451E-05	0.233E-04	0.233E-05	1.988239	8365415	3551	-16.80	11.1	0.313E-05	0.313E-05	0.313E-05	0.313E-05	0.313E-05
.54	-7.66	-1.10	14.12	2.79	1.14	0.339E-03	0.766E-04	0.146E-04	0.783E-05	0.184E-05	0.134E-05	0.224E-04	0.404	0.355E-05	0.355E-05	0.355E-05	0.355E-05	0.355E-05
8239	8377415	3551	-16.68	12.24	-6.09	0.46	14.08	3.50	1.04	0.339E-03	0.642E-04	0.146E-04	0.754E-05	0.178E-05	0.130E-05	0.224	0.224	0.224
E-04	0.365E-05	1.988239	8389415	3551	-16.56	10.46	-5.35	4.39	13.67	5.94	2.28	0.418E-03	0.912E-04	0.135E-04	0.780E-04	0.135E-04	0.135E-04	0.135E-04
05	0.165E-05	0.131E-05	0.948E-05	0.229E-05	0.229E-05	1.988239	8401415	3551	-16.44	4.66	-3.83	10.95	14.27	7.54	2.89	0.418E-03	0.418E-03	0.418E-03
4.69	0.105E-03	0.151E-04	0.841E-05	0.144E-05	0.165E-05	0.913E-05	0.143E-05	0.143E-05	1.988239	8413415	3551	-16.32	3.10	-2.86	13.35	1	0.100E-05	0.100E-05
4.87	1.86	0.559E-03	0.106E-03	0.151E-04	0.856E-05	0.171E-05	0.134E-05	0.134E-05	1.988239	8425415	3551	-15.72	1.58	-5.01	1.58	-5.01	1.58	1.58
1620	17.55	-4.15	10.01	14.13	5.21	1.08	0.781E-03	0.142E-03	0.130E-04	0.807E-05	0.171E-05	0.133E-05	0.133E-05	0.133E-05	0.133E-05	0.133E-05	0.133E-05	
1988239	8437415	3551	-16.08	7.99	-3.92	9.98	14.19	5.14	1.80	0.781E-03	0.155E-03							
05	0.138E-04	0.161E-05	0.948E-05	0.229E-05	0.229E-05	1.988239	8449415	3551	-15.96	4.50	-2.77	12.55	14.18	4.36	1.74	0.118E-02	0.196E-03	0.196E-03
8.80E-05	0.468E-05	0.144E-05	0.561E-05	0.561E-05	0.561E-05	1.988239	8461415	3551	-15.84	2.48	-3.22	13.80	14.69	3.31	1.34	0	1.34	0
1.23E-02	0.337E-03	0.157E-04	0.901E-05	0.468E-05	0.468E-05	0.246E-05	0.246E-05	0.246E-05	1.988239	8473415	3551	-15.72	1.57	-5.01	1.57	-5.01	1.57	1.57
13.82	15.31	4.28	1.49	2.1.49	1.08	0.781E-03	0.195E-04											
5.3551	-15.60	-1.61	-5.28	16.99	19.40	10.97	7.87	0.450E-02	0.626E-03	0.243E-03	0.243E-03	0.243E-03	0.243E-03	0.243E-03	0.863E-06	1.988239	848541	3551
06	1.988239	8497415	3551	-15.48	-13.84	1.66	26.77	32.54	16.68	11.28	0.450E-02	0.521E-04	0.246E-05	0.246E-05	0.246E-05	0.232E-04	0.232E-04	0.232E-04
1.42E-03	0.269E-04	0.291E-04	0.387E-05	0.387E-05	0.387E-05	1.988239	8509415	3551	-15.36	-20.30	2.44	32.06	38.98	9.73	4.41	0.187E-02	0.400E-03	0.400E-03
4.65	0.129E-02	0.341E-02	0.527E-04	0.527E-04	0.527E-04	1.988239	8521415	3551	-15.24	-15.24	-15.24	-15.24	-15.24	-15.24	-15.24	-15.24	-15.24	-15.24
4.653E-06	1.19E-04	0.335E-05	0.286E-05	0.286E-05	0.286E-05	1.988239	85569415	3551	-14.76	3.93	-7.00	17.27	21.51	11.66	5.82	0.262E-02	0.3	0.3
71E-03	0.131E-03	0.267E-04	0.119E-04	0.266E-05	0.266E-05	0.266E-05	0.844E-06	0.844E-06	0.844E-06	1.988239	8581415	3551	-14.64	6.61	-3.31	14.07	17.79	17.79
8.55	2.84	0.262E-02	0.405E-03	0.354E-04	0.354E-04	0.354E-04	0.127E-04	0.622E-06	1.988239	8593415	3551							
5.17	0.41	13.91	17.74	10.67	4.18	0.365E-02	0.671E-03	0.100E-03	0.217E-03	0.447E-03	0.447E-03	0.447E-03	0.447E-03	0.447E-03	0.273E-05	0.897E-06	0.897E-06	0.897E-06
1.988239	8605415	3551	-14.40	-9.98	-11.74	20.53	28.51	19.24	10.59	0.510E-02	0.109E-02	0.193E-03	0.442E-04	0.442E-04	0.442E-04	0.442E-04	0.442E-04	0.442E-04
1.297E-05	0.841E-06	1.988239	8617415	3551	-14.28	-6.25	-22.98	26.54	37.02	10.71	3.77	0.510E-02	0.966E-03	0.193E-03	0.193E-03	0.193E-03	0.193E-03	0.193E-03
4.4E-04	0.364E-04	0.511E-05	0.297E-05	0.742E-06	0.742E-06	1.988239	8629415	3551	-14.16	-7.32	-22.17	27.59	36.46	5.48	2.64	0.273	0.273	0.273
E-02	0.635E-03	0.147E-03	0.522E-04	0.364E-04	0.364E-04	0.681E-06	1.988239	8641415	3551	-14.04	-3.62	-23.90	-23.90	-23.90	-23.90	24.3	24.3	24.3
1.35.8	11.41	3.93	0.732E-02	0.732E-03	0.147E-03	0.468E-04	0.468E-04	0.110E-04	0.966E-06	0.966E-06	0.966E-06							
51	-13.92	-0.90	-25.22	22.02	35.06	11.00	3.33	0.953E-02	0.865E-03	0.142E-03	0.414E-04	0.414E-04	0.414E-04	0.414E-04	0.414E-04	0.287E-05	0.966E-05	0.966E-05

ASCII LIST OF km2002

## FILE 52 RECORD 8 6080 BYTES

1 1988290 12120671 3602 1356 -21.47 0.57 -6.93 23.39 6.64 2.18 0.147E-03 0.421E-04 0.382E-04 0.107E-04 0.179E-04 0.474E-05 0  
 1 .716E-06 0.556E-06 1988290 12152671 3602 -22.28 -0.44 -6.75 23.79 5.23 1.58 0.135E-03 0.435E-04 0.382E-04 0.130  
 1 .28E-04 0.250E-04 0.554E-05 0.665E-06 0.561E-06 1988290 12144671 3602 -21.86 0.63 -7.49 23.64 5.37 1.87 0.130  
 1 E-03 0.446E-04 0.327E-04 0.118E-04 0.250E-04 0.480E-05 0.744E-06 0.558E-06 1988290 12156671 3602 1392 -21.18 2.65 -6.9  
 1 4 23.00 5.83 2.74 0.755E-04 0.379E-04 0.157E-04 0.854E-05 0.338E-04 0.390E-05 0.744E-06 0.554E-06 1988290 12168671 36  
 1 02 1404 -18.30 1.78 -6.60 20.00 6.47 4.78 0.141E-03 0.362E-04 0.135E-04 0.800E-05 0.338E-04 0.302E-05 0.690E-06 0.544E-06  
 1 75E-05 0.665E-06 0.548E-06 1988290 12192671 3602 1428 -20.70 4.01 -8.70 23.82 8.85 5.37 0.147E-03 0.464E-04 0.170  
 1 E-04 0.861E-05 0.590E-04 0.583E-05 0.297E-05 0.659E-06 1988290 12204671 3602 1440 -25.51 3.92 -9.62 28.50 8.20 3.  
 1 30 0.189E-03 0.497E-04 0.562E-04 0.106E-04 0.590E-04 0.895E-05 0.297E-05 0.670E-06 1988290 12216671 3602 1452 -25.97 5.  
 1 87 -9.74 29.11 6.95 1.68 0.189E-03 0.587E-04 0.765E-04 0.177E-04 0.111E-03 0.152E-04 0.121E-05 0.592E-06  
 1 28671 3602 1464 -2.62 2.45 -9.13 28.62 -6.63 1.90 0.167E-03 0.482E-04 0.765E-04 0.174E-04 0.111E-03 0.131E-04 0.121E-05 0.5  
 1 78E-06 1988290 12240671 3602 1476 -24.38 0.05 -7.93 26.38 7.18 3.37 0.856E-04 0.398E-04 0.541E-04 0.125E-04 0.107  
 1 E-03 0.138E-04 0.130E-05 0.584E-06 1988290 12252671 3602 1488 -23.76 2.57 -9.16 26.50 7.86 3.53 0.856E-04 0.411E-  
 1 04 0.541E-04 0.111E-04 0.195E-03 0.221E-04 0.163E-05 0.635E-06 1988290 12264671 3602 1500 -26.54 2.64 -10.10 29.14 6  
 1 .38 1.76 0.105E-03 0.446E-04 0.191E-04 0.936E-05 0.195E-03 0.163E-04 0.163E-05 0.611E-06 1988290 12276671 3602 1512 -27  
 1 .33 -0.95 -10.91 30.01 -6.67 3.01 0.125E-03 0.474E-04 0.327E-04 0.101E-04 0.103E-03 0.139E-04 0.897E-06 0.579E-06  
 1 8290 12288671 3602 1524 -28.55 1.08 -11.68 31.56 7.59 3.57 0.206E-03 0.461E-04 0.327E-04 0.108E-04 0.139E-03 0.171E-04 0.897  
 1 E-06 0.591E-06 1988290 12300671 3602 1536 -30.28 2.58 -11.00 32.89 6.54 2.00 0.206E-03 0.483E-04 0.584E-04 0.141E-  
 1 04 0.144E-03 0.227E-04 0.332E-05 0.692E-06 1988290 12312671 3602 1548 -28.99 3.13 -11.28 31.64 5.38 2.19 0.115E-03  
 1 0.478E-04 0.584E-04 0.137E-04 0.144E-03 0.165E-04 0.332E-05 0.683E-06 1988290 12324671 3602 1560 -29.91 2.40 -12.59 3  
 1 2.79 5.06 2.95 0.287E-03 0.556E-04 0.503E-04 0.104E-04 0.590E-04 0.632E-05 0.744E-06 0.559E-06 1988290 12336671 3602  
 1 1572 -33.67 2.80 -12.55 36.22 4.21 2.04 0.287E-03 0.519E-04 0.303E-04 0.992E-05 0.590E-04 0.543E-05 0.665E-06 0.552E-06  
 1 1988290 12348671 3602 1584 -33.50 2.21 -11.66 35.97 6.16 2.38 0.253E-03 0.485E-04 0.584E-04 0.121E-04 0.166E-04 0.467E-  
 1 05 0.126E-05 0.591E-06 1988290 12360671 3602 1596 -31.22 1.80 -12.62 34.38 7.56 3.25 0.299E-03 0.625E-04 0.584E-04  
 1 0.126E-04 0.216E-04 0.532E-04 0.315E-04 0.216E-04 0.438E-05 0.204E-05 0.623E-06 1988290 12372671 3602 1608 -31.76 4.52 -13.25 3.37 0  
 1 2.99E-03 0.532E-04 0.342 6.34 3.42 0.264E-03 0.466E-04 0.315E-04 0.113E-04 0.1338E-04 0.779E-05 0.204E-05 0.631E-06 0.665E-06 0.552E-06  
 1 11.54 34.22 6.34 3.42 0.264E-03 0.466E-04 0.315E-04 0.113E-04 0.1338E-04 0.779E-05 0.204E-05 0.631E-06 0.665E-06 0.552E-06  
 1 1 3602 1632 -32.17 4.31 -11.36 34.63 5.54 3.64 0.264E-03 0.448E-04 0.303E-04 0.100E-04 0.1338E-04 0.692E-05 0.771E-06 0.555E-06  
 1 06 1988290 12408671 3602 1644 -32.52 3.24 -11.69 34.92 5.28 3.56 0.135E-03 0.389E-04 0.163E-04 0.871E-05 0.950E-05  
 1 0.234E-05 0.104E-05 0.216E-04 0.564E-06 1988290 12420671 3602 1655 -31.26 2.88 -10.80 33.43 4.89 2.76 0.135E-03 0.385E-04 0  
 1 .223E-04 0.935E-05 0.119E-04 0.294E-05 0.104E-05 0.569E-06 1988290 12432671 3602 1668 -31.45 4.23 -9.94 33.64 5.57  
 1 2.04 0.174E-03 0.383E-04 0.413E-04 0.105E-04 0.280E-04 0.470E-05 0.690E-06 0.557E-06 1988290 12444671 3602 1680 -29.90  
 1 4.27 -9.71 32.25 6.24 2.03 0.206E-03 0.448E-04 0.413E-04 0.108E-04 0.280E-04 0.434E-05 0.744E-06 0.566E-06 1988290  
 1 12456671 3602 1692 -30.73 3.07 -10.82 33.07 5.41 2.38 0.233E-03 0.594E-04 0.240E-04 0.944E-05 0.455E-04 0.423E-05 0.665E-06  
 1 0.5579E-06 1988290 12468671 3602 1704 -33.26 2.60 -12.48 35.85 4.81 2.41 0.233E-03 0.535E-04 0.368E-04 0.119E-04 0  
 1 .455E-04 0.689E-05 0.897E-06 0.581E-06 1988290 12480671 3602 1716 -34.10 2.56 -11.69 36.42 5.12 2.11 0.115E-03 0.3  
 1 62E-04 0.368E-04 0.123E-04 0.241E-04 0.578E-05 0.744E-06 0.561E-06 1988290 12492671 3602 1728 -33.15 0.89 -10.02 34.87  
 1 4.44 1.73 0.115E-03 0.397E-04 0.163E-04 0.935E-05 0.250E-04 0.484E-05 0.744E-06 0.569E-06 1988290 12504671 3602 1740  
 1 -33.86 0.74 -11.03 35.87 5.01 2.47 0.197E-03 0.449E-04 0.340E-04 0.969E-05 0.250E-04 0.468E-05 0.772E-06 0.573E-06  
 1 1988290 12516671 3602 1752 -34.81 1.17 -10.84 36.71 4.80 2.44 0.197E-03 0.472E-04 0.340E-04 0.942E-05 0.179E-04 0.444E-05 0  
 1 .801E-06 0.569E-06 1988290 12528671 3602 1764 -32.80 2.82 -9.52 34.56 5.67 3.35 0.120E-03 0.449E-04 0.130E-04 0.8  
 1 17E-05 0.179E-04 0.363E-05 0.801E-06 0.566E-06 1988290 12540671 3602 1776 -30.97 3.57 -9.82 32.91 5.12 3.23 0.135  
 1 ) E-03 0.459E-04 0.103E-04 0.780E-05 0.260E-04 0.382E-05 0.665E-06 0.559E-06 1988290 12552671 3602 1788 -31.34 3.40 -10.4  
 1 ) 3 33.33 3.61 2.08 0.135E-03 0.468E-04 0.170E-04 0.902E-05 0.260E-04 0.524E-05 0.665E-06 0.554E-06 1988290 12564671 36  
 1 ) 02 1800 -32.93 4.60 -11.48 35.46 5.14 2.32 0.135E-03 0.460E-04 0.170E-04 0.917E-05 0.107E-03 0.987E-05 0.640E-06 0.550E-06





## PIONEER VENUS 1

2-MIN OVERLAPPED AVG, EVERY MIN.

78-051A-12G, 13D

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 43 9-TRACK, 1600 BPI TAPES, WRITTEN IN ASCII. THERE ARE 22 RESTORED TAPES WRITTEN IN ASCII. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE TAPES ARE NOT IN TIME SEQUENTIAL ORDER. THE ORIGINAL TAPES WERE CREATED ON AN IBM 360 COMPUTER AND WERE RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	DD#	FILES	TIME SPAN
DR006220	DS006220	D072906	1-26	12/06/78 - 12/31/78
		D072907	27-116	01/01/79 - 03/31/79
		D072908	117-217	04/01/79 - 06/30/79
DR006221	DS006221	D072909	92	07/01/79 - 09/30/79
DR006222	DS006222	D072910	1-92	10/01/79 - 12/31/79
		D072911	93-183	01/01/70 - 03/31/80
		D072912	184-274	04/03/80 - 06/30/80
DR006223	DS006223	D072913	1-92	07/02/80 - 09/30/80
		D072914	93-184	10/01/81 - 12/31/81
		D072915	185-274	12/31/81 - 03/31/82
DR006224	DS006224	D072916	1-91	04/01/82 - 06/30/82
		D072917	92-183	07/01/82 - 09/30/82
		D072918	184-275	09/29/82 - 12/31/82
DR006225	DS006225	D072919	1-90	01/01/83 - 03/31/83
		D072920	91-181	04/03/83 - 06/30/83
		D072921	182-273	07/04/83 - 09/30/83
DR006226	DS006226	D072922	1-92	10/02/83 - 12/31/83
		D072923	93-183	01/01/84 - 03/31/84
		D072924	184-274	04/02/84 - 06/30/84
DR006227	DS006227	D072925	1-92	07/01/84 - 09/30/84
		D074165	93-183	09/29/80 - 12/31/80
		D074166	184-274	01/01/81 - 03/31/81
DR006228	DS006228	D074167	1-91	04/01/81 - 06/30/81
		D074168	92-183	06/30/81 - 09/30/81

## PIONEER VENUS 1

78-051A-12G

DR#	DS#	DD#	FILES	TIME SPAN
DR006229	DS006229	D079502	1-90	01/01/85 - 03/31/85
		D079503	91-182	10/02/84 - 12/31/84
		D079504	183-273	04/01/85 - 06/30/85
DR006230	DS006230	D079505	1-92	07/01/85 - 09/30/85
		D079506	93-184	10/01/85 - 12/31/85
		D079507	185-274	01/01/86 - 03/31/86
DR006231	DS006231	D079508	1-91	04/01/86 - 05/30/86
		D101570	92-275	07/01/86 - 12/31/86
DR006232	DS006232	D101571	181	01/01/87 - 06/30/87
DR006233	DS006233	D101572	184	07/01/87 - 12/31/87
DR006234	DS006234	D101573	1-182	01/01/88 - 06/30/88
		D101574	183-366	07/01/88 - 12/31/88
DR006235	DS006235	D101575	181	01/01/89 - 06/30/89
DR006236	DS006236	D101576	184	07/01/89 - 12/31/89
DR006237	DS006237	D101577	181	01/01/90 - 06/30/90
DR006238	DS006238	D101578	184	07/01/90 - 12/31/90
DR006239	DS006239	D101579	181	01/01/91 - 06/30/91
DR006240	DS006240	D101580	184	07/01/91 - 12/31/91
DR006241	DS006241	D101581	282	01/01/92 - 10/08/92

PIONEER VENUS 1

2 MINUTE OVERLAPPED AVERAGES, EVERY MINUTE

78-051A-12G/13D

THESE TAPES ARE ADDITIONS TO THE OTHER 24 9-TRACK TAPES, TOTAL  
-ING 36 TAPES FOR THIS DATASET. THESE 12 TAPES ONLY, ARE STORED  
AT 6250 BPI. THE D AND C NUMBERS ALONG WITH THEIR TIME SPANS ARE  
AS FOLLOWS:

D#	C#	TIMESPANS	FILES
D-101570	C-031196	07/01/86-12/31/86	184
D-101571	C-031197	01/01/87-06/30/87	181
D-101572	C-031198	07/01/87-12/31/87	184
D-101573	C-031199	01/01/88-06/30/88	182
D-101574	C-031200	07/01/88-12/31/88	184
D-101575	C-031201	01/01/89-06/30/89	181
D-101576	C-031202	07/01/89-12/31/89	184
D-101577	C-031203	01/01/90-06/30/90	181
D-101578	C-031204	07/01/90-12/31/90	184
D-101579	C-031205	01/01/91-06/30/91	181
D-101580	C-031206	07/01/91-12/31/91	184
D-101581	C-031207	01/01/92-10/08/92	282

REQ. AGENT

DHG  
SAR

RAND NO.

V0326  
V0337

ACQ. AGENT

HKH  
HKH

PIONEER VENUS 1

2 MINUTE OVERLAPPED AVERAGES, EVERY MINUTE

78-051A-12G,13D

This data set consists of 24 9-track tapes. The data is stored at 1600 BPI in ASCII, with a blocking factor of 30 logical records per block. The first block contains data headers, the fortran format, and data fill. Each file contains 24 hours of data. The tapes were created on an ibm 360 computer. The 'D' and 'C' numbers and time spans are as follows:

<u>D #</u>	<u>C #</u>	<u>Time Span</u>	<u># Files</u>
D-72906	C-25666	12/06/78 - 12/31/78	26
D-72907	C-25667	01/01/79 - 03/31/79	90
D-72908	C-25668	04/01/79 - 06/30/79	91
D-72909	C-25669	07/01/79 - 09/30/79	92
D-72910	C-25670	10/01/79 - 12/31/79	92
D-72911	C-25671	01/01/80 - 03/31/80	91
D-72912	C-25672	04/01/80 - 06/30/80	91
D-72913	C-25673	07/01/80 - 09/30/80	92
D-74165	C-26151	10/01/80 - 12/31/80	92
D-74166	C-26152	01/01/81 - 03/31/81	90
D-74167	C-26153	04/01/81 - 06/30/81	91
D-74168	C-26154	07/01/81 - 09/30/81	92
D-72914	C-25674	10/01/81 - 12/31/81	92
D-72915	C-25675	01/01/82 - 03/31/82	90

D#	C#	TIMESPAN	#FILES
D-72916	C-25676	04/01/82-06/30/82	91
D-72917	C-25677	07/01/82-09/30/82	92
D-72918	C-25678	10/02/82-12/31/82	92
D-72919	C-25679	01/01/83-03/31/83	90
D-72920	C-25680	04/01/83-06/30/83	91
D-72921	C-25681	07/01/83-09/30/83	92
D-72922	C-25682	10/01/83-12/31/83	92
D-72923	C-25683	01/01/84-03/31/83	91
D-72924	C-25684	04/01/84-06/30/84	91
D-72925	C-25685	07/01/84-09/30/84	92
D-79502	C-27759	01/01/85-03/31/85	90
D-79503	C-27760	10/01/84-12/31/84	92
D-79504	C-27761	04/01/85-06/30/85	91
D-79505	C-27762	07/01/85-09/30/85	92
D-79506	C-27763	10/01/85-12/31/85	92
D-79507	C-27764	01/02/86-03/31/86	90
D-79508	C-27765	04/01/86-05/30/86	91

Rec'd with add'l info  
12 tapes

September 8, 1993

Enclosed in this package are 12 more Pioneer Venus Orbiter OMAG and OEFD Summary Tapes. These tapes are in the same format as the previous ones that we have sent to you. The tapes cover the time periods from:

1986	Jul 1 0000	-	87 Jan 01 0000	orbits	2765	-	2947
1987	Jan 1 0000	-	87 Jun 30 2359	orbits	2948	-	3128
1987	Jul 1 0000	-	88 Jan 01 0000	orbits	3129	-	3312
1988	Jan 1 0000	-	88 Jun 30 2359	orbits	3313	-	3494
1988	Jul 1 0000	-	89 Jan 01 0000	orbits	3495	-	3678
1989	Jan 1 0000	-	89 Jun 30 2359	orbits	3679	-	3859
1989	Jul 1 0000	-	90 Jan 01 0000	orbits	3860	-	4043
1990	Jan 1 0000	-	90 Jun 30 2359	orbits	4044	-	4224
1990	Jul 1 0000	-	91 Jan 01 0000	orbits	4225	-	4408
1991	Jan 1 0000	-	91 Jun 30 2359	orbits	4409	-	4589
1991	Jul 1 0000	-	92 Jan 01 0000	orbits	4590	-	4773
1992	Jan 1 0000	-	92 Oct 08 2359	orbits	4474	-	5055

If you have any questions please contact:

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## Documentation for the Pioneer Venus Orbiter OMAG and OEOF Summary Tapes

These tapes contain two minute overlapped averages, with one minute centers, of the PVO magnetometer and electric field sensor experiments, OMAG and OEOF. Also included are spacecraft position and attitude data. The tapes contain data from the entire orbit of PVO and so contain both IMF and periaxis data. During orbit 3602 the spin-plane magnetometer sensors failed, and so after this orbit the magnetic field data columns contain only the Bz component. We receive 3 values for the P-sensor (Bz) rather than 1 value for Bx, By and Bz. Due to this, the columns for Bx, By and Bt are all flags. Bz is a 2 minute overlapped average of the 3 p-sensor values in Spacecraft coordinates.

The tapes were created using the ASCII format described in the "Pioneer Venus Mission Instructions for Data Submissions to the National Space Science Data Center". This should be referred to for general format information. These tapes are standard 1/2 inch, 9 track, unlabeled, ASCII, with fixed length blocked records. The blocksize is 7800 bytes, and the logical record length is 260 bytes. Thus there are 30 records per block.

As specified in the "Pioneer Venus Mission Instructions for Data Submissions to the NSSDC" the first three records are information on the format of the data.

Record #1: Format: (I3,32(1x,A4)) Gives the number of data columns in each data record (32), and 4 character descriptors for each.

Record #2: Format: (A260) Gives the Fortran format to be used in reading each data record.

Record #3: Fortran format is given in record #2. Contains the fill values which occur when no data is available.

Record #4-end: Time, orbit, seconds from periaxis, data.

On these tapes records 4-30 are also flagged with the fill values, and records 31 -1471 contain 24 hours of one minute data. Each 24 hours of data is then followed by a tape mark, separating the tape into files.

There are two consecutive tape marks after the last file on the tape.

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### PVO OMAG & OEOF 1 MINUTE SUMMARY TAPE

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#### DESCRIPTION OF DATA FIELDS

HEADER TITLE	CONTENTS	FORMAT	EXAMPLE (b = blank)	FILL
YEAR * 1000 + DAY OF YEAR	I8	b1984001	0	
MILLISECONDS OF DAY	I9	b86400000	0	
ORBIT NUMBER	I5	b1901	0	
SECONDS FROM PERIAPSIS	I6	-43200	0	
BX BX AVERAGE (GAMMAS IN VSO COORDS)	F6.1	b-40.5	999.	"
BY BY AVERAGE (VSO-VENUS SOLAR ORBITAL)	"	"	"	"
BZ BZ AVERAGE	"	"	"	"
BT B TOTAL AVERAGE	"	"	"	"
VBXX BX*BX COVARIANCE	F7.2	b100.10	"	"
VBXY BX*BY COVARIANCE	"	"	"	"
VBXZ BX*BZ COVARIANCE	"	"	"	"
VBYY BY*BY COVARIANCE	"	"	"	"
VBYZ BY*BZ COVARIANCE	"	"	"	"
BZZ BZ*BZ COVARIANCE	"	"	"	"
BT*BT BT*BT COVARIANCE	"	"	"	"
NB NUM OF HIRES MAG PTS AVERAGED	F6.0	b2880.	0.	
100M 100 HZ ELEC MAXIMUM (V/(M*HZ**.5))	E9.3	b.333E-07	1.0E+32	"
100A 100 HZ ELEC AVERAGE	"	"	"	
730M 730 HZ ELEC MAX	"	"	"	

730A	730 HZ ELEC AVE	"	"	"
5.4K	5.4 KHZ ELEC MAX	"	"	"
5.4K	5.4 KHZ ELEC AVE	"	"	"
30KM	30 KHZ ELEC MAX	"	"	"
KA	30 KHZ ELEC AVE	"	"	"
JX	SC POSITION X (VEN. RADII IN	F8.3	b-13.055	999.
VSOY	Y VSO COORDS)	"	"	"
VSOZ	Z	"	"	"
SPX	SPIN AXIS X (IN VSO COORDS)	F7.3	b-1.000	99.
SPY	Y	"	"	"
SPZ	Z	"	"	"
PLAT	PLANETARY LAT.OF SPACECRAFT (DEG)	F6.1	bb90.0	999.
PLON	PLANETARY LONG.	"	b360.0	"
SCLT	CELESTIAL LAT.OF SPACECRAFT (DEG)	"	bb90.0	"
SCLN	CELESTIAL LONG. OF S/C	"	b360.0	"
ELN	CELESTIAL LONG. OF EARTH	"	"	"
RSUN	DISTANCE TO SUN (AU)	F6.3	b1.000	9.
	TOTAL CHARACTERS -	260		

Note that the format and fill values do not need to be "hard coded" into a program, but can be read from the tape.

*20 tapes*

PVO Summary Tape

Generated by the UCLA Fluxgate Magnetometer Group

by

C. T. Russell

Institute of Geophysics and Planetary Physics

University of California

Los Angeles, California 90024

October 1985

## Introduction

The Pioneer Venus Orbiter was launched from earth on May 20, 1978 and arrived in Venus orbit on December 4, 1978. Overviews of the mission have been written by Colin (1980). Included in the instrument complement were an electric field detector measuring plasma waves in four frequency bands centered around 100 Hz, 730 Hz, 5.4 Hz and 30 kHz, and a fluxgate magnetometer measuring the magnetic field from D. C. to the Nyquist frequency of the instrument; often close to 1 Hz. These instruments have been described by Scarf et al. (1980a) and Russell et al. (1980). Measurements have been obtained almost continually from launch with the exception of a period of about one month every 19 months when Venus goes behind the sun as seen from the earth. Examples of the data obtained by these instruments can be found in papers by Scarf et al. (1980b) and Russell et al. (1981).

## Parameters on Summary Tape

The summary tapes contain two minute overlapped averages, every one minute of both the magnetometer (OMAG) and the electric field data (OEFD). In addition the tape contains the covariance matrix of magnetic field fluctuations and the maximum reading of the electric field detector in each of the channels. The magnetic field direction of the spacecraft position and the spin axis of the spacecraft are given in Venus Solar Orbital (VSO) coordinates. This coordinate system is analogous to the terrestrial GSE or Geocentric Solar Ecliptic coordinate system. The VSO X-direction points toward the sun; its Z-direction is normal to the orbital plane of Venus and its Y-direction is in the orbital plane pointing opposite to the direction of orbital motion. For purposes in which a knowledge of the field in spacecraft coordinates is needed, one can easily rotate the data using the spin axis orientation (cf. Russell, 1971). For purposes in which the sub-PVO planetary

position is important, the planetary longitude and latitude is given; for purposes in which the celestial position is important, the celestial longitude, and latitude of the spacecraft and the longitude of the earth are given, epoch 1950.0, as well as the heliocentric distance. The tapes contain data from the entire orbit of Pioneer Venus. The only data that has been removed is the daily calibration signal.

#### Tape Format

These tapes were created using the ASCII format described in "Pioneer Venus Mission Instructions for Data Submissions to the National Space Science Data Center". This document should be referenced for general tape information. The tapes are standard 1/2 inch, 9 track, 1600 BPI, unlabeled, ASCII with fixed length blocked records. The blocksize is 7800 bytes, and the logical record length is 260 bytes. Thus there are 30 records per block.

Each 24 hours of data is followed by a tape mark, separating the tape into files. The first three records of each file contain data headers, the Fortran format, and data fill as described in the NSSDC instructions. Records 4-30 of the first block are flagged with the fill values. Then each block after that is regular data (30 records = 1/2 hours of data in each block.) Thus there are 48 data blocks plus 1 header block per file. There are two consecutive tape marks after the last file on the tape. The description of the tape fields is given in Table 1.

#### Zero Levels of the Magnetometer

The amplitude of transverse waves is much greater than that of compressional waves in the interplanetary medium. Thus, the amplitude of the magnetic field usually remains roughly constant when the field direction changes. We used this

behavior to calculate the zero level of the magnetic field by solving for the zero levels that kept the field magnitude most constant. Only rotations of the field direction greater than 30° within a 2-hour period were used. Each month an average zero level was calculated as well as the standard deviation of this offset. Values greater than one standard deviation were discarded once the averages recalculated. The resulting spin axis zero levels are plotted in Figure 1. The slope of the least square fit to the line is 0.005 nT/yr with an initial value of 0.13 in December, 1978. These values have not been subtracted from the data.

#### Acknowledgments

The programming necessary for the production of these tapes was ably and rapidly performed by G. Maclean, and the checking of the magnetometer zero levels was performed by J. Dashkin. This work was supported by NASA contract NAS2-9491.

#### References

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- Russell, C. T., Geophysical coordinate transformations, Cosmic Electrodynamics (2), 184, 1971.
- Russell, C. T., R. C. Snare, J. D. Means, and R. C. Elphic, Pioneer Venus orbiter fluxgate magnetometer, IEEE Trans. Geosci. Remote Sensing GE-18, 32-35, 1980.
- Russell, C. T., J. G. Luhmann, R. C. Elphic, and F. L. Scarf, The distant bow shock and magnetotail of Venus: Magnetic field and plasma wave observations, Geophys. Res. Lett., 8, 843-846, 1981.
- Scarf, F. L., W. W. L. Taylor and F. Virobik, The Pioneer Venus orbiter plasma wave investigation, IEEE Trans. Geosci. Remote Sensing GE-18, 36, 1980a.
- Scarf, F. L., W. W. L. Taylor, C. T. Russell, and R. C. Elphic, Pioneer Venus plasma wave observations: The solar wind-Venus interaction, J. Geophys. Res., 85, 7599-7612, 1980b.

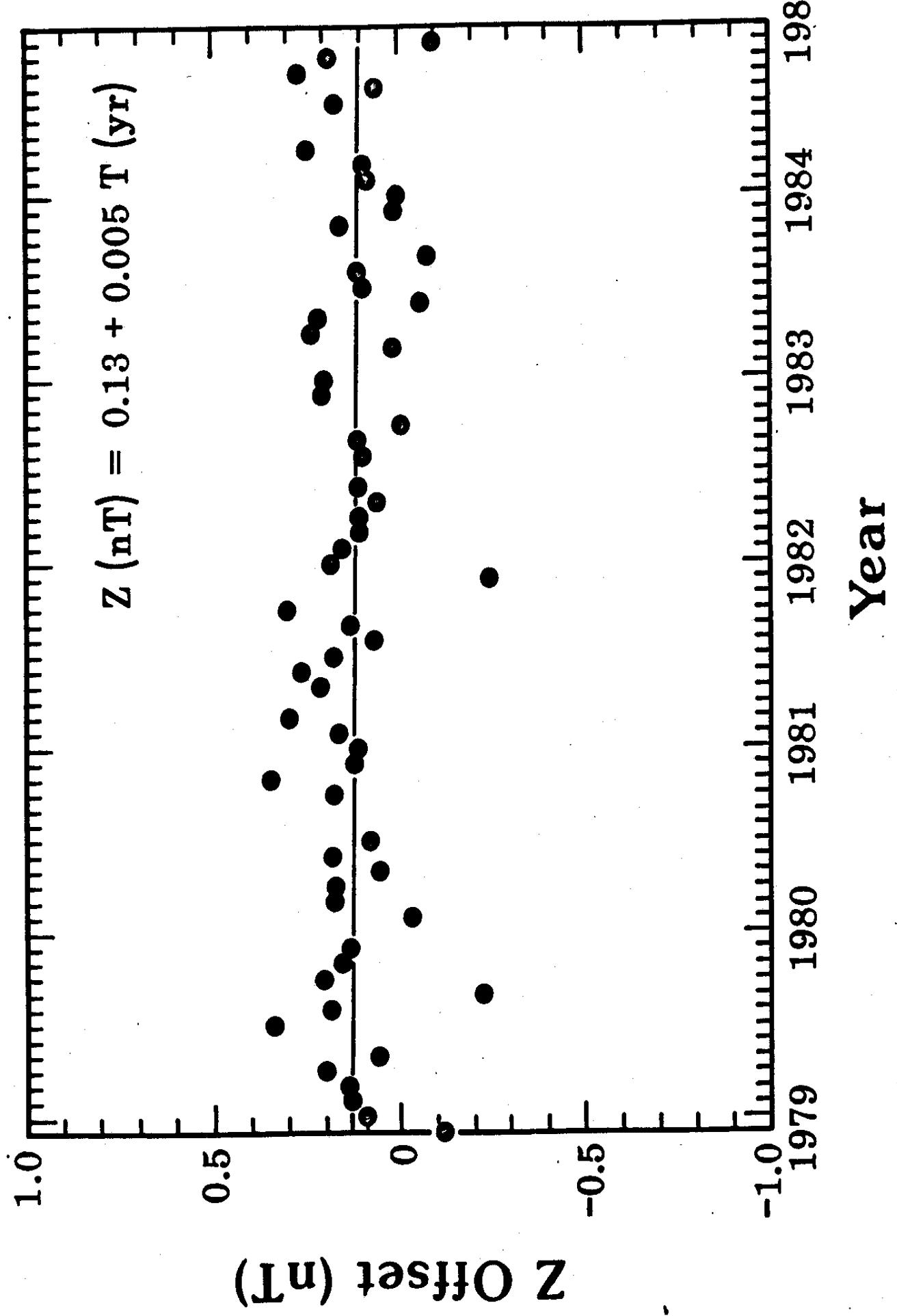
TABLE I

4

## DESCRIPTION OF DATA FIELDS

HEADER TITLE	CONTENTS	FORMAT	EXAMPLE (b = blank)	FILL
	YEAR * 1000 + DAY OF YEAR	I8	b1984001	0
	MILLISECONDS OF DAY	I9	b86400000	0
	ORBIT NUMBER	I5	b1901	0
	SECONDS FROM PERIAPSIS	I6	-43200	0
BX	BX AVERAGE (GAMMAS IN VSO COORDS)	F6.1	b-40.5	999.
BY	BY AVERAGE (VSO=VENUS SOLAR ORBITAL)	"	"	"
BZ	BZ AVERAGE	"	"	"
BT	B TOTAL AVERAGE	"	"	"
VBXX	BX*BX COVARIANCE	F7.2	b100.10	"
VBXY	BX*BY COVARIANCE	"	"	"
VBXZ	BX*BZ COVARIANCE	"	"	"
VBYY	BY*BY COVARIANCE	"	"	"
VBYZ	BY*BZ COVARIANCE	"	"	"
VBZZ	BZ*BZ COVARIANCE	"	"	"
VBTT	BT*BT COVARIANCE	"	"	"
NB	NUM OF HIRES MAG PTS AVERAGED	F6.0	b2880.	0.
100M	100 HZ ELEC MAXIMUM (V/(M*HZ**.5))	E9.3	b.333E-07	1.0E+32
100A	100 HZ ELEC AVERAGE	"	"	"
730M	730 HZ ELEC MAX	"	"	"
730A	730 HZ ELEC AVE	"	"	"
5.4K	5.4 KHZ ELEC MAX	"	"	"
5.4K	5.4 KHZ ELEC AVE	"	"	"
30KM	30 KHZ ELEC MAX	"	"	"
30KA	30 KHZ ELEC AVE	"	"	"
VSOX	SC POSITION X (VEN. RADII IN	F8.3	b-13.055	999.
VSOY	Y VSO COORDS)	"	"	"
VSOZ	Z	"	"	"
SPX	SPIN AXIS X (IN VSO COORDS)	F7.3	b-1.000	99.
SPY	Y	"	"	"
SPZ	Z	"	"	"
PLAT	PLANETARY LAT.OF SPACECRAFT (DEG)	F6.1	bb90.0	999.
PLON	PLANETARY LONG.	"	b360.0	"
SCLT	CELESTIAL LAT.OF SPACECRAFT (DEG)	"	bb90.0	"
SCLN	CELESTIAL LONG. OF S/C	"	b360.0	"
ELN	CELESTIAL LONG. OF EARTH	"	"	"
RSUN	DISTANCE TO SUN (AU)	F6.3	b1.000	9.
	TOTAL CHARACTERS =	260		

Note that the format and fill values do not need to be "hard coded" into a program, but can be read from the tape.



From: NCFMRS : MAJAMES 18-MAR-1996 10:32:22.51  
To: NCF : ALOPEZ  
CC:  
Subj: ASCII LISTING OF D74168

FILE 1 RECODE 1 7800 BYTES

## ASCII LIST OF D64168

7800 BYTES

0	938	-7102	.4	2.0	4.8	5.3	.16	-.18	.07	.57	-.26	.17	.04	259.	.418E-03	.492E-04	.120E-	
04	.820E-05	.184E-05	.139E-05	.832E-06	.570E-06	.3.268	3.001	2.658	.052	.006	-.999	29.4	281.4	3.3	154.0	279.1	.718	.198
1182	60000	938	-7042	.1	2.6	4.4	5.2	.18	-.13	.05	.47	-.20	.13	.05	234.	.418E-03	.538E-04	.120E-04
829E-05	.184E-05	.140E-05	.690E-06	.563E-06	.3.246	2.974	2.660	.052	.006	-.999	29.6	281.3	3.3	154.0	279.1	.718	.1981182	
120080	938	-6982	.1	2.7	4.2	5.0	.20	-.12	-.00	.15	.00	.02	.06	235.	.493E-03	.451E-04	.125E-04	.833E
-05	.178E-05	.140E-05	.690E-06	.560E-06	.3.224	2.946	2.662	.052	.006	-.999	29.8	281.3	3.3	154.0	279.1	.718	.1981182	
80000	938	-6922	.3	2.7	4.2	5.0	.11	-.02	.08	-.02	.03	.04	258.	.608E-03	.524E-04	.125E-04	.826E-05	

-178E-05	-140E-05	.772E-06	.567E-06	3.202	2.919	2.663	.052	.006	-.999	30.1	281.2	3.3	154.0	279.1	.718	1981182	24000
0	938	-6862	-1	2.7	4.2	5.1	.63	-.15	.08	.10	-.05	.09	.08	232.	.608E-03	.534E-04	.116E-04
E-05	.139B-05	.931E-06	.581E-06	3.180	2.891	2.665	.052	.006	-.999	30.3	281.1	3.3	154.0	279.1	.718	1981182	300000
38	-6802	-1.2	3.3	4.3	5.9	2.36	-.93	.77	.48	-.23	.63	.37	234.	.214E-03	.406E-04	.116E-04	
.139E-05	.931E-06	.587E-06	3.157	2.863	2.666	.052	.006	-.999	30.5	281.0	3.3	154.0	279.1	.718	1981182	360000	
6742	-2.2	3.6	5.8	1.20	-.36	.71	.30	.07	1.21	.80	260.	.368E-03	.414E-04	.135E-04	.821E-05	.178E-05	
9E-05	.931E-06	.580E-06	3.135	2.835	2.668	.052	.006	-.999	30.7	280.9	3.3	154.0	279.1	.718	1981182	420000	
-2.2	3.1	3.0	4.9	.77	-.26	.20	.48	.22	.80	.92	234.	.368E-03	.496E-04	.135E-04	.830E-05	.178E-05	
5	.801E-06	.571E-06	3.112	2.807	2.669	.052	.006	-.999	30.9	280.8	3.3	154.0	279.1	.718	1981182	480000	
0	2.5	3.1	4.5	.31	.12	.12	.50	-.05	.49	.27	233.	.368E-03	.526E-04	.120E-04	.836E-05	.178E-05	
90E-06	.563E-06	3.089	2.778	2.670	.052	.006	-.999	31.2	280.8	3.3	154.0	279.1	.718	1981182	540000		
2.6	3.4	4.7	.20	.24	.03	.51	.04	.14	.15	232.	.781E-03	.474E-04	.130E-04	.851E-05	.141E-05		
06	.561E-06	3.066	2.750	2.671	.052	.006	-.999	31.4	280.7	3.3	154.0	279.1	.718	1981182	600000		
3.1	4.4	.28	.02	.12	.39	.11	.27	.29	233.	.781E-03	.558E-04	.130E-04	.843E-05	.141E-05			
570E-06	3.043	2.721	2.672	.052	.006	-.999	31.7	280.6	3.3	154.0	279.1	.718	1981182	660000			
.3	4.3	.68	.28	.34	.49	.13	.30	.28	260.	.781E-03	.533E-04	.125E-04	.819E-05	.140E-05			
-06	3.020	2.693	2.672	.052	.006	-.999	31.9	280.5	3.3	154.0	279.1	.718	1981182	720000			
4.6	.27	.13	.01	.36	.11	.12	.27	234.	.206E-03	.415E-04	.116E-04	.813E-05	.139E-05				
2.997	2.664	2.673	.052	.006	-.999	32.1	280.4	3.3	154.0	279.1	.718	1981182	780000				
1.47	-.62	-.31	.75	.35	.27	.41	.234.	.435E-03	.468E-04	.125E-04	.825E-05	.184E-05	.931E-06	.577E-06	.2.		
973	2.635	2.673	.052	.006	-.999	32.4	280.3	3.3	154.0	279.1	.718	1981182	840000				
.21	-.77	-.41	.75	.24	.19	.31	.260.	.435E-03	.542E-04	.125E-04	.834E-05	.184E-05	.931E-06	.588E-06	.2.		
2.606	2.673	.052	.006	-.999	32.6	280.2	3.3	154.0	279.1	.718	1981182	900000					
.05	.03	.28	-.02	.19	.27	232.	.435E-03	.531E-04	.120E-04	.840E-05	.178E-05	.141E-05	.665E-06	.563E-06	.2.		
577	2.674	.052	.006	-.999	32.9	280.1	3.3	154.0	279.1	.718	1981182	960000					
.09	.03	.27	.10	.27	.41	.232.	.961E-03	.571E-04	.125E-04	.841E-05	.178E-05	.141E-05	.744E-06	.564E-06	.2.		
2.674	.052	.006	-.999	33.1	280.0	3.3	154.0	279.1	.718	1981182	1020000						
.20	.56	.36	.44	1.04	.234.	.961E-03	.625E-04	.130E-04	.833E-05	.178E-05	.141E-05	.832E-06	.574E-06	.2.			
674	.052	.006	-.999	33.4	279.9	3.3	154.0	279.1	.718	1981182	1080000						
.052	.006	-.999	33.7	279.8	3.3	154.0	279.1	.718	1981182	1140000							
.47	-.23	.87	.27	260.	.174E-03	.426E-04	.116E-04	.812E-05	.184E-05	.139E-05	.966E-06	.586E-06	.2.				
52	.006	-.999	33.9	279.7	3.3	154.0	279.1	.718	1981182	1200000							
-.09	.07	.02	.234.	.454E-03	.473E-04	.125E-04	.825E-05	.184E-05	.139E-05	.931E-06	.575E-06	.2.					
.006	-.999	34.2	279.6	3.3	154.0	279.1	.718	1981182	1260000								
.05	.06	.02	.234.	.454E-03	.540E-04	.125E-04	.830E-05	.178E-05	.139E-05	.744E-06	.565E-06	.2.					
6	-.999	34.5	279.5	3.3	154.0	279.1	.718	1981182	1320000								
.04	.03	213.	.339E-03	.494E-04	.130E-04	.844E-05	.178E-05	.141E-05	.665E-06	.563E-06	.2.						
.999	34.7	279.4	3.3	154.0	279.1	.718	1981182	1380000									
18	.04	104.	.401E-03	.468E-04	.130E-04	.826E-05	.178E-05	.139E-05	.772E-06	.560E-06	.2.						
35.0	279.2	3.3	154.0	279.1	.718	1981182	1440000										
.05	151.	.401E-03	.499E-04	.120E-04	.792E-05	.178E-05	.137E-05	.931E-06	.578E-06	.2.							
.3	279.1	3.3	154.0	279.1	.718	1981182	1500000										
0	234.	.401E-03	.460E-04	.120E-04	.811E-05	.139E-05	.966E-06	.589E-06	.2.679	.2.278	.2.668	.052	.006	-.999	35.6		





NO. 12/6 ETE NO. 1